

POST-DROUGHT RECOVERY STRATEGIES AMONG THE PASTORAL HOUSEHOLDS IN THE HORN OF AFRICA: A REVIEW

1. INTRODUCTION

1.1 Purpose of the Review

Pastoralism in the Horn of Africa is one of the most important economic activities from which millions of people derive their livelihoods. In terms of the number of pastoralists, an estimate made for the 1980s indicates that three of the top five countries in the world are found in this sub-region (Sandford 1983, 2). The sector involves substantial parts of the population in each country. For example, out of the total population, pastoral and agro-pastoral population are about 60% in Somalia; 33% in Eritrea; 25% in Djibouti; 20% in Sudan and 12% in Ethiopia (Abu Sin 1998, 120; Mohammed Salih and Ahmed 1993, 7). Pastoralists in this region keep a significant part of the livestock wealth. For example, in Ethiopia, 30-40% of the country's livestock is found in pastoral and agro-pastoral areas (Coppock 1994). In the Sudan, it is estimated that 80% of the livestock comes from pastoral and agro-pastoral areas (Abu Sin 1998, 120). In Djibouti and Somalia, the total livestock wealth comes from these areas. In addition, livestock originating from the pastoral and agro-pastoral areas of these countries has substantial contribution to the foreign exchange earnings.

However, the pastoral production system in this region and elsewhere in Eastern Africa is said to be under a critical situation in the sense that it has become unable to support the basic needs of people whose very survival is strongly linked to the performance of this sector. This dismal performance is attributed to several interrelated factors including population growth, recurrent drought, conversion of rangelands into other uses, weak governance, increasing insecurity, political and economic marginalization, policy and program related constraints to mention but a few (Kashay *et al.*, 1998; Mkutu 2001). Consequently, pastoralists in the Horn of Africa sub-region have long suffered from natural and manmade calamities including drought, political isolation, conflict as a result of competition for natural resources and falling levels of per capita income. In addition, inappropriate aid and development policies continue to affect pastoralists throughout the region (Toulmin and Moorhead 1993; Helland 1997).

Since recently a number of authors have started identifying pastoralism in Africa as a "crisis" (e.g. NOPA 1992; Niamir-Fuller 1994). Central features of this crisis include:

Prolonged droughts; population increases; encroachment of agricultural lands and conservation areas, leading to alienation of grazing lands and displacement of pastoralist populations; degradation of fallow land and land around inadequate numbers of water points; the marginalisation of pastoralists within national policies and hence development programmes; inadequate access to markets and unfavourable exchange rates between livestock and grains; inadequate supply of social services to mobile groups of herders; increasing levels of insecurity, warfare and conflicts between nation states; sedentarisation, out-migration and urbanisation; breakdown of traditional social and institutional structures; increasing marginalisation of women; growing general levels of poverty and vulnerability to famine.

The last few years have seen a major rethinking of some of the hallowed assumptions of range ecology and range-management practice. The usefulness of terms such as "vegetation succession", "carrying capacity" and "desertification" is being reassessed, particularly for the dry rangelands which are dominated by highly variable rainfall and episodic, chance events such as drought (Scoones 1994).

Although there is a growing and influential body of literature concerning failure of development interventions, conflict management, drought occurrences, early warning systems, drought coping strategies, little attempt has been given particularly to post-drought recovery strategies of pastoral households. Most of the studies carried out on drought and drought management in pastoral areas of the region under consideration have not been extended beyond such issues as short-term impacts and coping mechanisms. The available literature is particularly limited on the transition from drought to post-drought period as well as on the prevailing situation in the post-drought phase. There is little information on the post-drought period in general and on the recovery strategies in particular. Practices of pastoralists as well as experiences of external agents in the post-drought period have not been adequately researched and documented. Strengthening and rebuilding of appropriate post-drought recovery strategies, therefore, need an in depth analysis. The difference between socio-economic groups with regard to the effect of drought and their possibilities to cope with - and recover from - drought are not understood very well so far. Such knowledge is very useful for various stakeholders working in pastoral areas, including the local communities, in predicting food crisis and also in indicating appropriate actions to mitigate the crisis. It is based on the foregoing that this study was initiated by the Organization for Social Science Research in Eastern and Southern Africa (OSSREA) and the Institute for Development

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1.2 The Context: Delineating the Pastoral Sector

Pastoralism as an economic activity is identified on the basis of selected characteristics that are commonly taken into account in distinguishing this sector from others. Several works on pastoralism in the Horn of Africa are grounded on one or more of these selected characteristics to describe the behavior of pastoral societies in response to changes in socio-economic and ecological environment (e.g. Behnke 1994; Coppock 1994; Helland 2000; Hogg 1997a & 1997b; Lane 1998; Mohammed Salih and Ahmed, 1993; Mohammed Salih *et al.* 2001; Sandford 1983; Shazali and Ahmed 1999; Zaal 1999). The following six characteristics are identified to delineate the pastoral sector in the Horn of Africa region. These are regarded as of particular relevance to discussions of drought and recovery strategies among pastoral households in the sub-region under consideration.

1.2.1 Dependence on Livestock

The first and most basic characteristic of pastoral societies is their orientation toward livestock grazing on natural pasture. The income of a pastoral household is generally derived from specific economic activities, livestock and livestock related activities being the most important contributors (Ellis and Swift 1988; Hogg 1997a; Zaal 1999). This basic feature of a pastoral household suggests some implications on household's capital accumulation behavior under the circumstances. In this regard, Hogg (1997a, 4) identifies the four important consequences. First, pastoral capital can reproduce itself without intervention of any market mechanism. Therefore, unless herd owners have viable alternative forms of investment the tendency is for pastoralists to re-invest in herd growth. One of the inevitable consequences of this situation is that, other things being equal, livestock populations will eventually exceed the capacity of the range. Secondly, because pastoralism is geared towards herd reproduction, there will inevitably be a surplus of animals that can be disposed of without affecting the reproductive capacity of the herd. Thirdly, unlike the case for cultivators, post-drought recovery among pastoral households is a long and slow process because herd re-constitution after drought is a long and slow process. Fourthly, livestock dependence naturally renders pastoral households vulnerable to fluctuations in the terms of trade particularly between livestock and grain, which is worse during the period of drought.

1.2.2 Arid and Semi-Arid Environment

The second important feature of pastoral communities comes from the physical environment they inhabit. Countries of the Horn of Africa region are among the thirty-six countries in which most of the land belongs to the

arid and semi-arid environment (Sidahmed 2000). These arid and semi-arid environments are characterized by extreme variability and unreliability of rainfall both between different years and between different places in the same year. Consequently, these areas are characterized by the scarcity and seasonal variability of vegetation, and vulnerability to drought.

Pastoral areas, while they may provide options to produce some crop species in good years, are generally marginal to intensive crop production. As a result, livestock production appears to be the only available option under the existing technologies. However, this marginal nature of the physical environment still imposes certain constraints to “livestock production and settlement patterns”. In the context of drought and recovery strategies, some five implications of the physical characteristics of the pastoral environment could be mentioned following Hogg (1997a, 4). First, resilience to drought and disease determines livestock production than productivity. As a result pastoralists tend to maximize number than productivity per head contrary to what the mainstream livestock development discourse suggests. This is due to the fact that more productive species may be more vulnerable to starvation than poorly productive animals (Coppock 1994, 11). The second important implications that comes out of this arid and semi-arid environment is mobility. This is a vital response to the spatial effects of the variability of rainfall on fodder and water. Thirdly, diversification of herds is commonly practiced to mitigate the vagaries of this marginal ecological resource. Fourthly, herd growth “tends to be opportunistic rather than conservative”. This situation forces pastoralists to adopt the “strategy of tracking grazing availability” rather than “restricting herd numbers” as per their resilience to drought. As a result, “in good years livestock numbers will increase only to crash in bad years”. Fifthly, communal ownership of the rangeland is instituted, which otherwise limits access to a wide variety of potential grazing areas.

1.2.3 Multiple Resource Use

Currently, multiple resource use is a central feature in many production systems in general, and in pastoral and agro-pastoral systems in particular. It typically involves complex combinations of the following aspects (Cousins 1996):

- Different *categories of users* (e.g., individuals, households, kinship groups, corporate groups, villages, communities, tribes, ethnic groups);
- Users of different *status* (e.g., owners; co-owners; primary, secondary and tertiary users; leasers and lessees; unrecognized or "illegal" users);

- Different *uses* (e.g., gathering and cutting of foods, grass, fuel wood and materials for craft production; hunting; annual cropping; permanent cropping; grazing and browsing, by single or multi-species herds; water for livestock, domestic supply, irrigation);
- Resources of differential *productivity, economic value and ease of control* (e.g., stably productive gardens on fertile soils vs. rainfed arable fields of lower fertility; high productivity lowland grazing vs. low productivity extensive rangeland; close or permanent water sources vs. distant or seasonal water sources); and
- Different *sets of rights and obligations* for users of resources (e.g., rights to different uses, for defined time periods or seasons; rights of disposal; rights of occupancy, access or transit; reciprocal rights of access).

1.2.4 *Change and Adaptation*

In the context of pastoral production systems in Africa, the issues of change and adaptations are taken into account in the sense that pastoralism is not a static economic activity but an activity which dynamically adjusts itself to changes in ecological and social environment that are driven by both internal and external forces. For example, Manger (2000, 3-4) illustrates adaptation by East African Pastoralists and indicates that:

The natural Environment in East Africa is a varied one, with variation in altitude, rainfall patterns in dry and wet seasons, river systems, soil types and vegetation cover. This varied pattern has in basic ways affected the distribution of settlements and population movements, and the distribution of productive activities such as cultivation and grazing. The human responses to this variation have been to develop adaptive patterns that have been flexible enough to cope with the variation and to minimize risk. This coping has been characterized by movements across zones in different seasons and by combination of many activities- cultivation and animal herding; hunting and gathering; wage labor etc. Such a mixed economy puts demands on the labor power of economic units, their patterns of development, and knowledge and organizational capacity.

Manger (2000, 4) also states that adaptation strategies of pastoralists affected cultural and political boundaries.

Population movements, historically as well as contemporarily, can be understood in this context. Such movements and adaptations have also forged links between groups: violent ones such as cattle rustling and raids, peaceful ones such as marriages, reciprocal relationships built on sharing of animal and collaborative ones such as creating labor network. Regional markets and trading centers as well as towns were important meeting places that further added to the development of relationships. The same goes for the development of various power centers. East African states can historically be viewed as an

interaction between different ecological zones, and hence different adaptations (e.g., the highland lowland dimensions in Ethiopia and Eritrea, the Nile Valley/Savanna dimension in the Sudan), etc. The state centers were in the highlands and the Nile Valley but the exploitations of lowlands and savanna areas were basic mechanisms in maintaining the viability of the states.

On the issues of change and adaptation, Hogg (1997, 106) argues that traditional pastoral “land tenure is not something fixed in time and place, but something constantly adapting to new circumstances.” He further explains that these “land tenure changes are a reflection of wider economic and social changes in the nature and form of pastoral societies and land use practices.” This argument, however, is vague on the completeness of adaptations in the sense of responding well to any change that occurs exogenously to the system. The situation is of practical importance to those who argue for development interventions to help pastoralists adapt to a given changing condition.

1.2.5 Differentiation

Although there are commonalities in some respects, pastoral groups are differentiated along certain variables, for example, by their geographical location and ethnic background. The concept of differentiation generally emphasizes that not all pastoralists in Sub-Saharan Africa face the same kind of lifestyle and constraints, and hence there is clearly a need to distinguish more among different types of pastoral communities in designing policy and interventions, rather than just referring to a “homogenous” group of “African pastoralist”, as is often done in the literature (IISD 1999). It is important to note that while there are many similarities in the types of stresses and adaptive strategies faced, there are also significant differences which affect their livelihoods. Some of the communities are migratory, while others are transhumant pastoralists, settling in their villages for part of the year and moving with their herds as the seasons and availability of water and grazing for their livestock demands. Pastoral societies are also internally differentiated. Coppock (1994, 297) argues that African pastoralists are diverse and hence the concept of “average household” has little use in understanding the dynamics of the system or in prescribing blanket intervention approaches. In fact, Coppock further indicates the increasing trend of internal differentiation as the concept of “average household” is less valid today than 30 years ago when societies were not so diverse. Likewise, Opschoor (2001, 25) notes that it is important “to comprehend differences and understand the environmental, economic and political problems specific to each group and each context.” In the context of drought, drought management and recovery, these household diversities and regional variations would imply

different levels of vulnerabilities to the ill effects of drought as well as specificities in coping and recovery strategies.

1.2.6 Geographical Location

Different pastoral groups in the Horn of Africa are found adjacent to each other and in most cases in peripheral areas of their respective countries. For instance, in Ethiopia, most of the pastoral lands are found in the low-lying peripheral areas encircling the highland farming communities, bordering other pastoral groups in neighboring countries. This arrangement would entail some important implications. One is that the traditional production system requires periodic mobility, including cross-border mobility, in search of pasture and water. However, the situation in the Horn of Africa is becoming increasingly difficult due to several factors including political instability. Another implication of this geographical location is that localized droughts have a potential to spillover into other groups of pastoralists as affected groups tend to migrate with their animals and create pressure on pastoral resources in other places.

1.3 Organization of the Review

The review is organized as follows. Section 2 is on *Pastoralism in the Horn of Africa: Country Profiles*. This part of the review primarily presents the profile of pastoralism in Ethiopia and the Sudan. In addition, some information on other countries of the Horn region such as Djibouti, Eritrea and Somalia, is incorporated. The profile covers the role of pastoralism in the economy (in terms of contributions to employment, GDP, foreign exchange, etc.). The profile also summarizes policies and constraints faced by pastoral production and pastoralists in the countries under consideration. Section 3, *Drought and Its Impacts on Pastoralists*, establishes definitions and concepts of drought; its impacts on pastoral resources and household income; and the various coping strategies adopted by pastoralists. Section 4, deals with the central issue of the report, *Post-Drought Recovery Strategies*. This section of the review emphasizes recovery strategies by pastoralists and external agencies as well as constraints to post-drought recovery. Section 5, *Policies Mitigating the Impact of Drought*, summarizes short-term and long-term measures identified in the literature. Finally Section 6 summarizes and concludes the review, and implications for further research are suggested.

2. PASTORALISM IN THE HORN OF AFRICA: COUNTRY PROFILES

2.1 Ethiopia

Most of the available studies on pastoralism in Ethiopia estimate that pastoral and agro-pastoral communities in Ethiopia constitute roughly 10-12% of the total population. According to these studies, these groups occupy some 60% the country's land mass, mainly the peripheral areas of the country. The main pastoral communities are the Somali (53%), Afar (29%) and Borena (10%) living in the Southeast, Northeastern and Southern parts of Ethiopia, respectively, and the balance (8%) are found in Southern, Gambella and Benshangul regions (Coppock 1994; Hogg 1997b; Sandford and Yohannes 2000). The majority of these are pastoralists engaged in extensive livestock herding. Within and between each of these groups there are different adaptive specializations dependent on varying ecological, economic and cultural factors.

Table 1. Pastoral groups in Ethiopia by geographical location and region

Geographical location and region	Ethnic groups
North-East (Afar, Oromia and Somali Regions)	Afar, Somali, Argoba, Oromo
South (Oromia and Somali Regions)	Oromo, Somali
South-East (Somali Region)	Somali
South-West (SNNP and Gambella Regions)	Dasenetch, Hamer, Mursi, Bodi, Bumie, Bena, Erbore, Tsemay, Nuer, Anuak, Ari, Bali, Dime, Nyangtom, Chai, Trima, Ruli, Tinshana Muguji
West (Benishangul Gumuz Region)	Komo, Shinasha, Gumuz, Benshangul

SOURCE: Dawit Abebe (2000)

Ethiopia's pastoral groups manage some 40% of the national cattle herd, one quarter of the sheep, three quarters of the goats and nearly all the camels. About 90% of livestock export of the country comes from these areas (Hogg 1997a; Sandford and Yohannes 2000; Sentayehu 1996). Livestock in these areas also supply almost all unofficial exports across the borderlands where animals are first trekked to the neighboring countries and re-exported to the Middle East (Sentayehu 1996; Tegegne *et al.*, 1999).

Table 2. Livestock population in heads in the lowland/pastoral regions of Ethiopia

Pastoral region	Cattle	Sheep	Goats	Camels	Equines
1. Afar	3,600,000	2,000,000	3,000,000	900,000	200,000
2. Oromia (Borena Zone)	1,400,000	1,000,000	500,000	530,000	60,000
3. Oromia (Other Zones)	100,000	200,000	300,000	10,000	20,000
4. Somali	5,200,000	6,600,000	3,300,000	1,100,000	360,000
5. SNNP	450,000	340,000	500,000	1,000	40,000
6. Benishangul and Gambella	100,000	100,000	100,000		20,000
Total lowland	10,850,000	10,240,000	7,700,000	2,541,000	700,000

SOURCE: Sandford and Yohannes, 2000

The pastoral areas are characterized by frequent droughts with high animal mortality followed by famine and high death rates in the human population. For example, in Borena, the 1984-85 drought depressed livestock growth by driving calf mortality rate as high as 90% (Coussins and Upton 1988b as cited in Helland 2000; Fasil *et al.*, 2001, 11). According to some studies on pastoralism in Ethiopia, drought has increasingly become the major deterring factor of pastoral production. When a drought occurs it substantially increases livestock mortality; reduces livestock prices and raises the price of food grain, a situation that aggravates the problem of pastoralists by shifting the terms of trade in favor of their purchases than their sales (Futterknecht 1997). In a recent field report of the pastoral areas of Ethiopia, Sandford and Yohannes (2000) mentioned, among others, the following drought events:

- The 1973/74 drought that affected the pastoral areas in general and the Afar in particular. This drought led to a 72% decrease in cattle population, a 45% and 34% decrease of sheep and goats, respectively, and a 37% decrease in camels;
- The 1983/85 that led to a 60% decrease (mortality, slaughter, sales) in cattle numbers in the worst affected parts of Borena;
- The 1995-97 drought that led to “a 78% decrease in cattle herd size and a 45% decrease in camel herd size among sampled households in the Somali and Borena areas of Ethiopia” (p.6); and
- The 2000 drought that led to “an acute scarcity of livestock feed in most parts of the pastoral areas, particularly in Somali Region, Bale and Borena zones in Oromiya Region, and in SNNPR”(p.3) For example, for cattle, the estimate of drought induced herd-size decreases between May 1999 and May 2000 in better-worse scenarios indicated 15-45% in Afar, 30-80% in Borena Zone, and 40-80% in Somali Region.

Other threats to the pastoral production system are population growth, privatization of grazing land and water resources, land use shifts in favor of sedentary farming, as well as inappropriate livestock development projects attempted in different periods and the development of large-scale and small-scale irrigation schemes (Helland 1997a, 1997b, 2000; Boku 2000). The contribution of all these problems is said to have led to sedenterisation, weakening of local institutions and traditional cultures, degradation of natural resources and growing vulnerability to ecological, economic and cultural stress (Fasil *et al.* 2001).

In sum, the transition to the current predicament is a result of the accumulated impacts of the various internal and external factors that substantially weakened the asset bases of pastoral households. Hogg (1997a, 5) described Ethiopia's pastoral societies transition as follows:

State incorporation has restricted mobility, while market penetration has increased dependence on markets for food. Many pastoral groups, such as Afar, have lost important grazing land to the State and to their pastoral neighbours, which has increased their vulnerability to drought. Similarly, Borena in the southern rangelands are being shunted westward by the expansion of Somali speaking groups to their east. This has resulted in the loss of control over important well complexes. Throughout the rangelands agriculture is expanding, while former communal grazing areas are being enclosed. These changes are likely to have long term consequences for food security in these areas as old adaptations give way to new ways of doing things.

As pastoralists become more dependent on the market for food they are increasingly exposed to the effects of a volatile market. This particularly affects the poor. Poor people have to sell proportionately more of their herd products on the market to obtain food than the rich. In times of drought this dependence is exacerbated which in turn accelerates the processes of economic differentiation within society. The ongoing market integration tends to make the rich richer and the poor poorer and, inevitably, more vulnerable to drought (Dahl and Hjort 1979 as cited in Hogg 1997a)

In response to the various problems encountered by the pastoral groups, some development projects were initiated and implemented since the last decade of the Imperial Era. USAID and World Bank assisted projects began to be implemented and emphasized the provision of veterinary services, construction of water points, creation of trade routes connecting to the highlands, and creation of public pastures (Helland 1997b). Specialized institutions were also established to facilitate development intervention in these areas. For instance, the Livestock and Meat Board (LMB) was established in 1964 with the objective of improving marketing

infrastructure mainly in the Borena and Afar pastoral areas of Ethiopia. The Second Livestock Development Project went into operation in 1973, establishing slaughter facilities for provincial towns and cities and improving stock routes and market places for livestock

The socialist government that came to power in 1974 continued implementing the already started livestock development projects. The Third Livestock Development Project (TLDP) was about to be implemented by the time of transition and continued to be implemented after some provisions were added to it. It was designed to develop rangelands, including water and roads, in the pastoral areas. However, discouraged by the outcome of the projects, external donors were reluctant to extend further support to the projects. The government continued implementing the projects with its own funds. The Southern Rangelands Development Unit (SORDU) is one such major project that continued its operation in the southern rangelands.

The present Federal Government that took over from the socialist regime in 1991 continued with the Southern Rangelands Development Unit (SORDU), which is still operational. Concerning the current government's policy on pastoralists, Hogg (1997a, 3) mentions that the National Policy for Disaster Prevention, Preparedness and Management (NPDM) recognizes that livestock preservation is a key aspect of disaster preparedness in pastoral areas. Accordingly, the specific recommendations that are of long-term as well as emergency nature included alleviating fodder and water scarcity, avoiding distress disposal of stock and controlling decline in health status.

Overall, development interventions implemented during the Imperial and the Derg socialist regime had focused on livestock development in the sense of commercialization of pastoralism to exploit the livestock potential in the country. However, it is said that these interventions failed to achieve intended objectives. Some studies argue that development interventions have eroded vital indigenous institutions and affected the environment negatively (Helland 2000). According to Hogg (1997), development projects allowed little local participation; focused on technical solutions ignoring indigenous strategies; focused on implementation of project components neglecting their maintenance and sustainability; and little focus on cost recovery.¹ The fragility of the pastorlist's environment is identified as a major challenge to the present government's intention to settle pastorlists and expand irrigation schemes. Nowadays, numerous agencies have programs in the pastoral areas, but these are primarily focused on emergency relief, with inadequate attention to development, and there is

¹ This is not to deny the benefits accrued to the pastoralists. For instance, water projects created access to previously unutilized land; veterinary services reduced livestock mortality; and roads improved market integration (Coppock 1994).

little co-ordination. Like any other development interventions in the Horn, the end results of these interventions in Ethiopian pastoral areas were failure to achieve sustainable development although these projects were initiated with good intentions (Mesfin 2001). Some of the lessons gained from the implementation of development projects included:

- Past development interventions were based on erroneous assumptions of traditional pastoral production systems and operated with a top-down approach;
- There was no attempt to deal with pastoral problems using a holistic approach;
- There was lack of desire on the part of policy makers to understand the dynamics of pastoralists and to act accordingly; and
- Lack of opportunity to undertake research in order to better understand the dynamics of the pastoral way of life and the traditional methods of resource management.

2.2 Sudan

On a global scale, Sudan perhaps ranks first in terms of pastoralist population size (Markakis 1998, 41). About 66 per cent of Sudan is arid land, which is mainly pastoralists' abitat. Pastoralism in the Sudan involves about 20% of the population and accounts for almost 40% of livestock wealth. The livestock sector plays an important role in the economy of the Sudan, accounting for about 20% of the GDP, meeting the domestic demand for meat and about 70% of national milk requirements and contributing about 20% of the nation's foreign exchange earnings. It is also a very significant source of employment for about 80% of the rural workforce.

Table 3. Total and nomadic population in the Sudan, 1955-1993

Census year	Total population	Nomadic population	Percent
1955	10,263,000	1,405,000	13.69
1973	14,819,000	1,630,000	10.99
1983	20,564,000	2,191,000	10.56
1993	N/A	N/A	N/A
1998	N/A	N/A	18.00*

SOURCE: Population Censuses

Note: * Estimate

These animals are almost entirely concentrated in ecologically marginal and semi-arid areas under communal land tenure systems. These areas also contain zones of large-scale irrigated and rainfed agriculture, small-scale farming, and protected wildlife areas and forest reserves. These tend to be supported by both the government and international donors and reflect land legislation and development interventions that favors non-pastoral activities. The interaction of climate, soils, topography and drainage creates a succession of different environments for which competition between pastoralism and farming is fierce.

Rainfall is the main factor influencing the distribution of human and livestock populations. The annual rainfall ranges between 75 mm in the extreme north to 1500 mm in the extreme south. Accordingly, four ecological zones with variable grazing potentials can be identified: desert; semi-desert; low rainfall savannah; and high rainfall savannah in the flood plain in the south (see table 4).

The semiarid zone of the Sudan encompasses about 70% the surface area of the country. It extends roughly 800 km from latitude 10° to 16° N. Seventy percent of the Sudanese population lives in this zone with herding and farming as the main sources of livelihood. Despite the existence of large irrigation schemes (e.g., Gezira, New Halfa, Rahad) and large-scale mechanized rain-fed farming (Gedaref, Blue Nile, Sennar, White Nile and South Kordofan states), the majority of the rural population depends mainly on herding and small-scale rain-fed cultivation, which has been exposed repeatedly to hazards of drought during the last three decades of the 20th century. Compared to the preceding two decades, the precipitation deficit for this period has amounted to 40-50%.

Different livestock species and breeds tend to thrive in the different ecological zones that have distinct grazing qualities. The natural range is generally unpredictable in time and space and so no one single zone is qualified to accommodate livestock all year round. Seasonal mobility is therefore adopted to compensate for the localized temporal and spatial shortages in pasture and water, to escape biting flies and muddy conditions, and to avoid large-scale rainfed and irrigated farming where livestock admission is prohibited.

Table 4. Livestock distribution by ecological zone, Sudan

Ecological zone	Location	% of total area of the country	Dominant vegetation	Livestock species
Desert	North of Lat. 16°N	29.0	Sparse in valleys and water courses	Camels, desert sheep
Semi-Desert	14°-16° N	19.6	Short grasses and thorny bushes	Camel, sheep and goats during wet season
Low-Rainfall Savannah	10°-14° N	51.1	Tall grasses and thorny trees	Cattle, sheep and goats
High-Rainfall Savannah	South of Lat. 10° N	10.3	Tropical forests, swamp and floodplain in southern Sudan	Cattle, sheep and goats during the dry season

Most pastoral lands in the Sudan are associated with a particular tribal homeland (*dar*), defined by customary rights. Within the *dar* grazing is communal. Conflicts associated with competition for pasture and water were suppressed since the colonial time with the maintenance of policies that restrict different tribal groups to their respective *dars*. This policy was severely undermined by the enactment of the 1970 Unregistered Land Act, the 1971 Local Government Act and the 1981 Regional Government Act (Shazali 1988; Babiker and Abdel Gadir 1999).

Table 5. Regional distribution of livestock by type in (%), 1998, Sudan

Region	Cattle	Sheep	Goats	Camels
Western Sudan	36.0	39.7	36.2	60.0
Eastern Sudan	4.8	11.7	6.9	25.0
Central Sudan	27.3	21.7	21.2	11.9
Northern Sudan	3.1	3.6	5.4	3.1
Southern Sudan	28.8	23.3	30.3	0.0
Total	100.0	100.0	100.0	100.0

SOURCE: Hassan, 2001.

The greater portion of livestock production in the Sudan belongs to the nomadic and semi-nomadic pastoralists. These groups constitute about 25 to 40% of the total population of the Sudan and own about 92% of the Sudan's national herd. Thus, when one talks about the contribution of the livestock sector to the national economy, one is essentially referring to the contribution of nomadic and semi-nomadic pastoralists.

As the name implies, agro-pastoral groups depend more on crops and less on livestock when compared to the nomadic or semi nomadic groups. Agro-

pastoralism is practiced in a relatively settled arrangement. Unlike the settled farming population, these groups keep a considerable part of the national herd, especially sheep and goats, which are raised in small villages all over the country but particularly in western Sudan. Animals are usually grazed in the context of what can be termed 'group herding', under the supervision of one shepherd, around the settlements. Due to the large livestock population and the short distances covered, areas around the settlements often display evidence of overgrazing.

In terms of the principal type of livestock herded, the nomadic and semi-nomadic pastoralists in the Sudan can be divided into two main types: *Abbala* and *Baggara*. The terms *Abbala* and *Baggara* lack any ethnic or territorial connotations; rather, they are derived from the Arabic words *ibil* and *Bagar*, which mean camels and cattle, respectively. The following table provides the regional distribution of the major nomadic and semi-nomadic camel and cattle herders and agro-pastoralists in the Sudan.

Table 6. Pastoral groups in the Sudan by region and specialization

Region	Camel herders	Cattle herders	Agro-pastoralists
Eastern	Beja (Bisharyin, Amarar, Hadendowa), Rashayda, Ababda, Shukriya, Lahawin, Kawahla	Beni Amer, Shukriya	Hadendowa, Shukriya
Central	Shukriya, Batahin, Rufa'a El Sherig, Rufaa al-Hoi (northern Badiya) Kababish, Kawahla, Hawawir,	Kenana, Ahamda, Selim, Rufaa al-Hoi (southern Badiya)	Ingesana, Berta, Uduk
Kordofan	Shenabla, Beni Gerrar, Hamar, Maganin	Hawazma, Meseiriya Zurug, Meseiriya Humur.)	Hamar, Nuba, Gawamaa, Bedeiriya
Darfur	Meidob, Zeyadiya, Jellul, Mahriya, Zaghawa	Rizeigat, Maalya, Habbaniya, Beni Helba, Beni Hessein, Ta'aysha, MBororo (pastoral Fulani)	Masaleet, Fur, Berti, Daju
Southern		Dinka, Nuer, Shilluk	Azande, Bari, Mandari, Latuka, Kakwa, Fajulu, Murle, Anuak, Acholi, Ngodo, Bongo, Topoza

Development Policies

Livestock development in the Sudan, as elsewhere in Africa, has had two broad policy objectives: increased animal output and range conservation.

The 1970s represent the beginning of a new era of development policies directly or indirectly related to pastoralism. Although some interest in livestock development was evident in the Ten Year Plan (1961-1970), the plan displayed a clear bias in favor of agricultural and industrial development. Nevertheless, this period witnessed a considerable increase in veterinary services and some livestock development projects. Towards the end of the plan in 1970, high fertility rates were recorded as a result of the introduction of modern medicines and vaccination and disease control campaigns.

The 1980s were a period of stress, great anxiety and uncertainty among the pastoralists. The period was characterized by a lack of sense of direction in government policies, drought, famine, and general economic hardships. In such a climate, it is not surprising that emphasis in government policies has shifted from development to crisis management. This period also witnessed the unprecedented mass migration of pastoralists to towns and relief centers. The civil war in southern Sudan alone created over one million urban refugees (most of whom were pastoralists) living in appalling conditions, ravaged by starvation, malnutrition and disease.

In the 1990s, the severe economic recession halted all development activities, especially in the pastoral sector. As a result, herders were severely affected by drought and the general environmental degradation. This is evident in the rapid loss of livestock. At the present time, the government is more concerned with solving the problem of food shortage rather than with the recovery of pastoralism, which still continues to be the major source of livelihood of a significant portion of the Sudanese people. Neither does pastoral development appeal to donors because it is not thought to provide quick returns on investment in the manner demanded by foreign investors. Consequently, developments in the non-pastoral sectors (mainly, large-scale irrigated and rain-fed mechanized farming) compounded pastoral problems by restricting access to dry season water and grazing resources.

In southern Sudan, pastoral development effort has always been insignificant due to the absence of security because of the ongoing civil war. Even during the brief years of peace (1972-1983) no serious effort to support pastoralism was made. Some initiatives were envisaged in the context of the Jonglei Canal project, but that has been disrupted by the resumption of the civil war in 1983. The war has disturbed traditional subsistence activities and resulted in acute food shortages, population displacement, out-migration, and the near total collapse of pastoralism.

The incapacitation of the state is evident in the fact it was unable to formulate a policy towards rehabilitation let alone development. Policy

objectives such as herd-recovery and raising productivity were not on the agenda. However, it is only fair to mention that export promotion measures were the only policy objectives cherished and entertained by the government. It was not surprising that livestock exports increased even during the drought of the early 1980s and 1990s. This has created domestic meat shortages, which forced the government in the mid-1980s to import cheap red meat from Australia.

The organizational difficulties of mounting any project in the pastoral areas are formidable. The remoteness of most pastoral areas and the poor living and working conditions have discouraged well-qualified staff and caused frequent staff changes. This has seriously affected the so-called pilot projects which have been conducted on a stop-go basis with little adherence to the original plan of operation. Most of them suffered from a confusion of aims, commercial or experimental. Above all, research has been carried out without reference to the problems faced by the producers in the pastoral sector. Whilst this may not have been inconsistent with the adopted strategy, most of the projects paid lip service to the knowledge of the pastoralists. Since Independence no significant multi-disciplinary study was made of the traditional systems of pastoral production. In most cases, research tends to concentrate on physical resources such as soils, vegetation and water.

Overall the performance of pastoral production in the Sudan has been constrained due to a number of natural and policy related factors. Favor for large-scale irrigated schemes and the consequent loss of land, little or no infrastructure development in the pastoral areas and disincentives on agricultural exports are among the major policy related issues. Recurrent droughts, civil strife, and animal and human population growth are also important factors that contributed to destitution and poverty in the Sudan. The low productivity of the nomadic herds and the long distances between production areas and the major consumer centers and export outlets pose serious difficulties with respect to transportation reflected in high seasonality of supply of livestock and their products. Consequently, the availability of livestock and their products in the local and export markets is by no means a reflection of their numbers.

2.3 Somalia

Somalia, bordered by Kenya in the south, Ethiopia in the west, Djibouti in the northwest, the Gulf of Aden in the north, and the Indian Ocean in the east, covers an area of about 638,000 sq. km (Putman and Noor 1993). It is almost entirely arid, with most of the country receiving an average annual rainfall of less than 200 mm. In southern Somalia, a limited area around Baidoa receives an average of 500–600 mm. Usually, the first, more-reliable, rains fall from about April to June; then there is a dry season of about 4–5 months, and the often-unreliable second rains may occur in November–December. The problem in the dryland areas is that neither

rainy season is sufficiently reliable in quantity or distribution to produce a crop regularly, so that production is uncertain at the best of times (Hutchinson 1989 as cited in IDRC 1996).

With hot, dry weather all year around, except at the higher elevations in the north, most of Somalia has a semi-arid to arid environment suitable primarily for the nomadic pastoralism that more than half the population practices. Prior to the recent strife, about 60% of the population in Somalia were pastoralists or agro-pastoralists, and about 20% were agriculturalists. Except for a small number of Somalis who rely on fishing, the remainder of the population were urban dwellers, employed as government workers, shopkeepers, factory workers, and traders. In 1990, for example, agriculture contributed about 65% of the GDP, of which livestock was responsible for just over 50% (Putman and Noor 1993). Pastoralists raise camels, cattle, sheep and goats. Whereas, agro-pastoralists rely on a mixture of herding and farming (i.e., the principal food crops grown are sorghum, corn, sesame, cowpeas, sugar cane and rice; commercial crops include banana, grape fruits, cotton, *myrrah*, frank incense).

Livestock represents the bulk of Somaliland's economy on livestock trade. Although the pastoralism is believed to be an important sector in the economy, reliance upon a single export market renders the Somaliland's economy extremely vulnerable to external forces. Many of these stock belong to nomadic or transhumant herdsman, who often move to and from the Ogaden area of Ethiopia or other areas with their herds, depending on the availability of grazing and water supplies.

Similar to all other countries in the region, there is also an increasing trend in sedentarization and agro-pastoralism (Farah 1997). In recent years, in suitable growing areas, an increasing number have taken to growing some sorghum while maintaining their livestock, which are taken to the traditional seasonal grazing area by some of the young men of the family. Animal traction is used by some farmers, but is not widespread. The two important rivers in the south of the country, the Shebelle and the Juba, are being increasingly used for irrigation, particularly of maize and sorghum. There are also limited areas of plantation crops, principally bananas for export, sugar cane, and some citrus and other crops (IDRC 1996).

2.4 Eritrea

Eritrea with a total area of 121,320 sq km is a recent addition to the Horn region following its independence in 1991. Its climate is characterized by hot, dry desert strip along the Red Sea coast; cooler and wetter in the central highlands; semiarid in western hills and lowlands. Similar to other countries in the sub-region, pastoralists and agro-pastoralists inhabit the lowlands.

According to FAO (n.d.), about 49% of the area of Eritrea is rangeland suitable for grazing. These rangelands provide over 90% of the feed requirements of free grazing livestock. However, owing to the erratic and uneven distribution of rainfall a great part of the rangelands do not grow sufficient grass to support the existing livestock population. As a result, especially during critical times, livestock either suffer severe feed shortages or migrate to neighbouring countries, which is not usually possible due to conflicts in the border areas.

Recently, the livelihoods of pastoral/cattle herding communities in the mentioned areas have been seriously weakened because of limited and erratic rainfall. Lack of adequate forage and drinking water, coupled with long daily walks in search of feed and water, have imposed a serious strain on the animals, leading to poor health and increased mortality. The livestock/grain terms of trade have sharply deteriorated as a result of various problems including that of the poor health condition of livestock. Problems in the livestock sector are compounded by the limited ability of the Animals Resources Department of Ministry of Agriculture to treat the most common animal diseases and parasites such as Blackleg, Anthrax, PPR, Sheep-pox, FMD, Endo and Ecto-parasites.

In order to safeguard pastoral livelihoods, FAO has formulated four interventions in collaboration with the Ministry of Agriculture aimed at protecting livestock in the drought-affected regions. The overall objective of the FAO projects is to reduce livestock losses because of the drought. The expected benefits from the interventions mentioned were to provide immediate benefits to livestock owners and strengthen the ability of affected pastoral communities to recover from the current drought situation and regain their resilience and self-reliance. However, it seems that interventions in pastoral areas of Eritrea are more of mainstream livestock development than pastoral development.

2.5 Djibouti

In Djibouti, about 0.16 million people, which is 25% of the total population of the country, are involved in pastoralism (Mohammed Salih and Ahmed 1993,7). Pastoralists come from two ethnic groups, the Somali and Afar. These two ethnic groups predominate the whole population of Djibouti: the Somali (60%) and the Afar (35%). The same groups also inhabit the adjacent borderlands of the neighboring countries.

The contribution of pastoralism to the economy is very limited. Agriculture, which is represented by nomadic pastoralism, contributes only 3% of the country's GDP. This is largely constrained by the small size of the pastureland available for grazing. The country covers a total area of 21,000 sq. km of land which is desert, torrid and dry, and permanent pastures represent only 9% of the total land area. The pastoral activity is also constrained by recurrent droughts and limited availability of water. In

addition, inter-ethnic conflicts are increasingly challenging cross-border mobility for pasture and water.

Since the mainstay of Djibouti's economy is the services sector (75% of GDP), pastoralism doesn't seem a priority concern, however. Nevertheless, the fact that the country borders with other pastoral communities in other countries such as Ethiopia and Somalia (and now with Eritrea), Djibouti has been an important route for pastoralists in the Horn region that enabled them to access external livestock markets of Middle East countries as well as manufactured goods produced elsewhere. The cross-border trade in this sub-region has become an important option to diversify activity and sources of income (Little 2000; Sintayehu 1996; Tegegne *et al.*, 1999).

3. DROUGHT AND ITS IMPACTS ON PASTORALISTS

3.1 What is drought?

Fluctuating rainfall and the occurrence of drought are accepted features of arid and semi-arid areas in general and the pastoral areas of the Horn of Africa in particular. According to FAO (2002, 1-2), the history of drought is described as follows:

Drought, in many occasions in the last five decades, had come to prominence in the news, portraying famines, agricultural production failures, disasters and similar disheartening experiences during the second half of the twentieth century. It is not really a new threat to life or to human well being, but an old phenomenon, which, frequently or occasionally, hits parts of the earth causing damage with varying duration and intensity. In old times, incidences of drought were reported in the Greek Mythology and elucidated beautifully in the Holy Bible and the Glorious Koran. In recent history, during the last 300 years, dilapidating and scorching droughts continually struck many different parts of the world at various intervals, causing havoc and distress. Few examples could be mentioned such as the USA Great droughts of 1726, which continued for 23 years, and later 1930 drought, which lasted for 10 years, and the devastating droughts of the Sahelian Countries in Africa between 1968-1973 and most of the 1980s.

Drought, as a natural hazard, has been the subject of many studies by scientists from various disciplines and professions. Definitions of drought, therefore, differed according to the nature of needs for water or moisture. A simple definition addressing failure of the rain in its normal season has gone through various modifications. Several terms and definitions for drought included seasonal drought, contingent drought, meteorological drought, agricultural drought and hydrological drought. Other terms were proposed to qualify a drought according to land use or need such as “pastoral drought” and “ecosystem drought” (FAO 2002). The World Meteorology Organization proposed two definitions for drought: a) Prolonged absence or poor distribution of precipitation; and b) Period of abnormally dry weather sufficiently prolonged for the lack of precipitation to cause a serious hydrological imbalance. Furthermore, the United Nations Convention to Combat Desertification (UNCCD), Article 1, gave the following definition: “Drought” means the naturally-occurring phenomenon that exists when precipitation has been significantly below normal recorded levels, causing serious hydrological imbalances that adversely affect land resource production systems.” It further gave the following definition for a measure relating to drought: “Mitigating the effects of drought means activities related to the prediction of drought and intended to reduce the vulnerability of society and natural systems to drought as it relates to combating desertification.” (FAO 2002). Drought is thus intricately related to the lives

of the pastoralists of the Horn of Africa for centuries, but it had really projected itself to famine and destitution.

Drought as a Physical Event and as a Social Construct

Drought is commonly taken as a physical event consisting of some degree of shortfall in rainfall over a period of time. This in turn affects the level of primary production of plants (grasses, trees and crops), which support livestock and human populations (Toulmin 1983, 70). Blench and Marriage (1999) indicate the misconception in such a way that “the monitoring, measuring and modeling of climate is usually conceptualized as a technical matter left to meteorologists and distinguished from the realm of both policy and crisis management.” This implies that “scientists present technical data, while politicians, relief agencies and NGOs are to come up with appropriate responses.” They argue that such a simple division cannot be sustained. It is underlined rather that “world weather systems constitute a unity, but climatic patterns and events are categorized according to social constructions.” According to this proposition drought exists “in relation to what is considered to be normal rainfall rather than as entities that can be defined objectively.”

Therefore, lack of rainfall is considered as an inadequate measure of the consequent changes in pasture and livestock productivity and for predicting the effects on human populations depending on such. First, it is necessary to distinguish between *total* rainfall and *useful* rainfall, the latter refers to rain that can be effectively used by plants for their growth and development to maturity. Without data on the distribution of precipitation within the rainy season and in relation to the growth cycles of different plants it is difficult to draw conclusions as to the consequences of a decline in the total rainfall received (de Vries 1983). Secondly, it cannot be assumed that for any decrease in pasture production that there will be a proportionate decrease in livestock productivity, since it is unlikely that there is a linear relationship between the two variables. During times of pasture shortages animals may eat a much higher proportion of dry matter produced and may graze forage not eaten in normal years (Sandford 1976). Moreover, herd management practices may change during drought so as to increase the capacity of the herd to make good use of a particular area of grazing (Stanley Price 1079). Thirdly, the rainfall experience of a single year should be related to previous trends in order to assess its physical and social impact. Fourthly, and related to the above, the impact of any shortfall in forage production will depend on current and past levels of exploitation in relation to the average carrying capacity of pastures. Where animal stocking levels have regularly been exceeding the long-term capacities of the range, a decrease in rainfall and forage production will have a more marked effect because of the weakened state of stock and pasture (Toulmin 1983). Finally, any

measure of drought should take into account the geographical spread of these conditions. Thus, while localized droughts may be very regular events around which pastoral systems are able to organize themselves, traditional systems of cooperation and sharing may be unable to cope with drought conditions on a regional scale (Hjort 1976).

3.2 The Role of Drought

The central role of drought in traditional pastoral systems of production could be understood in relation to (i) the mechanisms by which balance is maintained between humans, herds and pasture, and (ii) descriptions of the management and husbandry decisions of individual stock-holders. Most of the definitions given above simply viewed drought as an event concerned with lack of water, usually as a result of rainfall failure. A drought is considered to be over when the rains return. For the victims of drought, however, the seriousness of a drought is not only related to the incidence of rain, but also depends to a great extent on the availability of other supplementary resources. And more important, among pastoral people the period of recuperation from drought may be much longer than the return of the rains would lead us to assume.

The temporal relationship between rainfall and food production is one of a certain delay in effect. In the case of arid areas, a good rain enables the cultivation of cereals such as millet and sorghum, but the crop can only be harvested after three to five months. The animals must get pregnant before they can give milk. How soon they can be milked after rains depends upon the type of animal, on how quickly they respond to an improvement in the pasture and on the length of their pregnancy. Sheep and goats give milk after half a year, but with camels and cattle the delay is longer, since they carry their calves for more extended period. In the case of camels, the first calves are born in time for the rains of the following year. A good year can have effects lasting for the whole of the following year, even if this should be bad. Those who have camels and cattle can still get milk. Surplus grains from a successful cultivation could be stored for the bad year and used both for feeding the family as well as the herd. But the system does not always work in this ideal way. A drought, which lasts for several years, can cause severe variations in the proportions of the herd, which at any particular time are giving milk or are dry. A good year after a long drought makes all camels pregnant and the following year there will be plenty of milk but no animal, which are free to be impregnated. The next year there will again be a shortage of milk, irrespective of the amount of rain falling. Besides such fluctuations in productivity, there are also the demographic effects of disaster. Disproportionate numbers of deaths of certain age categories of animals, or a hiatus in births, create very-long term waves of imbalance in the composition of the animal population. An even development of the herds and their production over time is thus a critical and difficult issue. Dependable pasture, which can be used in dry years, and secure access to

supplementary fodder in the form of bought grain, are the resources needed to meet such difficulties and thus reduce mortality (Hjort and Dahl 1991).

The consequences of prolonged droughts may have to be lived with for several years, even if the grass is green and the browse sprouting. It is acute crisis of drought, which tends to draw most of the attention, whether we talk of the mass media, social science research, historical records or folk memories. The long-term effects are experienced as difficulties and poverty by the people directly hit by them, but there has so far been very little research done on them anywhere in the world. When the need for such research is realized, it is usually too late for the necessary baseline study to be done, and most development-oriented research, based as it were on RRA, PRA or whatever, operates with too short a time span to be able to cover and comprehend such processes.

In the pastoral context, drought should not be seen as some external event, alien to the experience and working of the pastoral economy but rather as an element within the production system itself, around which producers orient their activities, determining forms of organization and strategies to be followed. An understanding of the behavior and strategies of pastoral communities should therefore be based on recognizing that the society places much more stress on mitigating the effects of downswings in economic fortune than in getting the most out of the upswing. In other words, traditional pastoral systems are better understood if one supposes them to be more concerned with reducing potential losses than with maximizing individual gains.

3.3 Effects of Drought in Pastoral Areas

Nowadays, the Horn of Africa region is one of the most affected by natural and manmade disasters. According to FAO (2002), more than half the region's people survive on less than US\$1 a day, and millions of the world's hungriest people live in this part of the world. In the region, drought and conflict are identified as the main causes, which often exacerbate the problem of food production, distribution and access, within an already difficult environment of fragile ecosystems, poverty, and sometimes, poor economic performance and governance.

In order to understand how drought affects pastoralism it is important to ask "how are pastoralists' livelihoods affected by drought?" The most direct impact of a shortage in rainfall on pastoralists' livelihoods is the drying up of water sources and declining forage resources for livestock. Water and forage are the most important resources for pastoralism and changes in their availability greatly influence livestock conditions, milk production and ultimately pastoralists' livelihood security, which primarily depends on the livestock and livestock products. Livestock, which is the most important

asset for pastoralists, is directly dependent on access to forage and water resources. Access to forage and water resources tends to decrease during a large-scale drought with the result that pastoralists lose assets.

Pastoralists are mainly faced with two processes during drought that adversely affect their capacity to support themselves, effectively raising the minimum herd numbers required to maintain the household. First, they face a fall in levels of productivity from their herds following losses in their livestock capital from higher mortality rates, low or zero calving rates, reduced production of milk and weight loss in animals that reduces their market value. These factors by themselves would make the pastoral enterprise and household less able to provide for its needs. For instance, Coppock (1994, 163-4) indicates that the 1983-84 drought in Borena, Ethiopia, reduced 60% of cattle density owing to 42% lost to livestock mortality, 14% lost to forced sale and 4% lost to slaughter. He also mentioned that the decline of milk production was very high, 92%. This had forced households to change their diet composition from more milk to more grain and reduce their calorie intakes.

Second, in addition to reduced levels of productivity within the livestock sector, pastoralists are usually faced during droughts with changes in the terms of trade that adversely affect the purchasing power represented by their herds. This is because where drought conditions also touch the farming sector, there will be a reduced quantity of grain available to be marketed. Moreover, demand by farming communities for livestock products is likely to fall, due to reduced productivity in the agricultural sector as a result of drought and poor condition of animals coupled with the relatively income elastic demand for livestock products such as milk and meat, in contrast to grain. For instance, Coppock (1994, 164) mentions that the above-mentioned drought in Borena caused the pastoral terms of trade to decline by 90% as a result of a decline in the prices of livestock and a rise in the prices of grain.

Drought turns into famine if the value drops to the extent that they can no longer purchase the food they need to sustain themselves. Poor people are most vulnerable to the impact of drought because they have less purchasing power, which means less food entitlements² (Oba 1997). Famine is not the only danger associated with drought; another major danger in the long-term is destitution (Sommer 1998, 8). It is argued that famine is a first and immediate risk, but the long-term risk is destitution of pastoralists. Once pastoralists become destitute, food insecurity becomes a chronic - rather

² Entitlement refers to goods, services and resources over which people have effective command in using them to benefit their livelihood. Famine can be defined as prolonged decrease in the food intake of large numbers of people to levels below what they need to maintain reasonable nutritional condition (TDCPU 1992, 7; Hussein *et al.* 1993 as cited in Sommer 1998).

than temporary - problem, because economic opportunities in pastoral areas outside the pastoralist sector are generally poor.

Several case studies indicate that the pattern of changes are similar in different sequences of drought. Toulmin (1986 and 1995) and others, for instance, divided the drought period into three phases based on the condition of pasture production, livestock numbers and conditions, and grain and livestock prices (table 7).

Table 7. Phases of drought and effects

Phase	Effects	Remark
First	<ul style="list-style-type: none"> Decline in forage production. Imbalance between livestock numbers and available forage. Livestock numbers start to fall, through sales and deaths among the most vulnerable. Condition of animals becomes worse and cereal harvests fail. Grain prices rise and livestock prices decline. 	Drought conditions are sufficiently harsh and widespread for extensive movement to be unable to compensate for falling fodder availability.
Second	<ul style="list-style-type: none"> Herd numbers continue to fall, as sales and deaths continue. Shortages of grain continue to keep food prices high. There is still a pressure on herders to sell further stock in order to purchase food. 	At the end of the second phase, forage starts to recover due to the start of rainfall. If food aid is delivered, the levels of stress will be somewhat moderated.
Third	<ul style="list-style-type: none"> Livestock numbers remain well below the level, which could make effective use of the available grazing as in the pre-drought period. Poorer households still may be under pressure to sell stock, due to food shortages. Richer ones may be able to reconstitute herds. Some pastoral households become totally destitute and must receive food relief. Cereal prices fall, while the price of animals starts to rise rapidly, due to the shortage of animals and the intention of herders to reconstitute their herd. Most notably, the demand for young breeding stock is very high 	Rainfall, grain harvests and pasture conditions have recovered from the previous drought conditions.

Different pastoral groups have their own description of drought based on its severity. For example in Ethiopia, the Afar pastoral groups describe drought in three main stages as mild, average and acute (table 8).

Table 8. Stages of drought, features and examples as described by Afar pastoralists

Stages	Features	Examples
Mild	Occurs when the short series of showers (Konaitu-October to November, Debaba-December, Dedaa- January, Dira-February and Sugum-March/April) fail to come after the Kerma (main rainy season-July to September) even if the pervious Kerma is good. Usually characterized by late start and early cessation of the main rains and/or the absence of short rains.	Occurred from 1994 on wards (drought occurred not in all years but in few.
Average	Occurs if there is only partial rain in the preceding Kerma following the situation explained above under mild.	Occurred from 1993 to 1994 (in this period people did not move out of their territory).
Acute	In addition to the mild condition, if there is total absence of the preceding Kerma, this situation is expressed as acute drought.	Occurred from 1982 to 1985 (people died migrated and tremendous number of camels, cattle, sheep and goats died).

SOURCE: Fasil *et al.* 2001, 17

Similarly, Fasil *et al.* (2001, 30) attempt to describe drought occurrences in the Borena pastoral areas based on the *Geda* calendar. People described drought occurrences since the last five *Gedas* as follows:

Geda Goba (1969-1976): It was reported that during this period there was average drought in Borena. The duration of the drought was short and did not actually cover the whole of Borena. People moved their animals to places where there was relatively better moisture and grasses for animals.

Geda Jilo Aga (1977-1984): This was the period where acute drought occurred and covered the whole Borena. The drought stayed for three years without rainfall. Therefore people were unable to move from one place to the other for grazing and water. There was no food. People were unable to get milk and meat from animals. Many animals died. People were forced even to eat dead animals. Later on, however, relief aid reached and saved peoples' lives

Geda Boru Guyo (1985-1992): In this period, the drought affected some parts of Borena. People were able to move from place to place with their animals. However, the movement was affected by conflicts between the *Geri Somali* of Region Five and the Borena due to set up of regional boundary. This aggravated the drought situation in Borena.

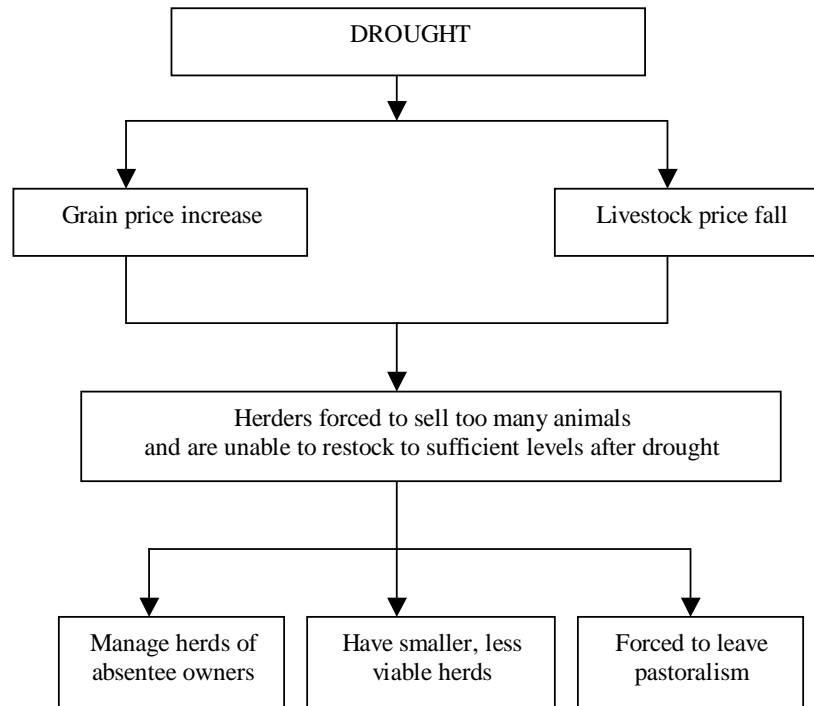
Geda Boru Medaa (1993-2000): During this period there was average drought in most parts of Borena and acute drought in some areas such as

Yabello and Teltelle. Mobility was also hindered due to conflicts mentioned above.

Geda Liben Jelbessa (2001-to date): This is the current *Geda*. There was good rain during March-May 2001. But the effects of the previous droughts still persisted and some households still depend on relief aid. Animals do not have good body conditions and fertility rate is reduced. In addition, the signs of the local indicators such as physical conditions of the rangeland and animals triggered fear among people, of another cycle of drought.

Other groups of pastoralists in the Horn may also have their own descriptions about the occurrences of drought although there is no recorded information. Effects of drought in pastoral areas of the Horn have various consequences, the most important being sustained food shortage. According to Fasil *et al.* (2001), food shortage is defined by people as lack of food for the family during a certain period of the year where the available food from livestock or other sources do not keep the household with food throughout the year. They reported that drought in one area might affect the situation in another area by influencing prices in the local market, increased grain prices and decreased livestock prices. Various studies (many of them unpublished) recorded that both the pastoralists and agro-pastoralists ranked the effect of drought on the different socio-economic groups with respect to its impact on household food security. A drought usually hits different socio-economic groups differently with regard to the food security situation at the household level. For pastoral groups, wealth status of the household is mainly dependent on the number and composition of the animal herds (camels, cattle, sheep and goats). For agro-pastoralists the wealth status will, in addition to the number and composition of the herds, depend on their landholdings.

The IFAD's (n.d.) experience in Africa and other pastoral areas regarding the effects of drought is depicted in the following chart:



The experiences of major droughts during the last four decades in the Horn of Africa show that pastoralists have been affected more than other groups. Climatic variability is very high in the pastoral areas of this sub-region and people often have to cope with long periods without rainfall. Sommer (1998) argues that meteorological drought cannot be avoided but its impact, such as famines, disease outbreaks, and destitution, can be greatly influenced by timely and effective intervention of institutions such as local and national governments and aid agencies.

3.4 Pastoralists' Strategies for Coping with Drought

Several studies have indicated that pastoralists have various coping and adaptive strategies in response to a disaster causing decline in food availability and entitlements in abnormal seasons or years (Ahmed and

Abdel Ati 1996). It is also said that populations living in marginal environments are much better to cope with periods of food stress than those living under more secured conditions. This is due to the fact that pastoral households are used to living on only a little food for months as they do every year during the long dry season (Futterknecht 1997, 176).

Coping strategies vary depending on the stage of severity of drought as, mild, medium and acute stages of drought (Fasil *et al.* 2001). There are also differences between different households in a given community arising from differences in capabilities to respond to food stress due to drought. Obviously, the most vulnerable people to famines are those who struggle to survive in vulnerable households even under normal circumstances, and their ability to mitigate this vulnerability is dependent upon their abilities to adapt. People in vulnerable systems, like the pastoralists in Afar and Borena, are more likely to pursue *adaptive strategies*,³ seeking to use all available options at all times to survive and to preserve assets for future livelihoods.

For Barton *et al.* (2001), however, coping strategies and adaptive strategies could sometimes overlap because he mentioned that livestock mobility, livestock marketing and livelihood diversification as strategies which are both coping and adaptive strategies. On the other hand, Fasil *et al.* (2001) and Barton *et al.* (2001) similarly argued that coping strategies are useful in the short term, but do not necessarily bring a change in livelihoods. Some grazing practices and increased charcoal production are examples of ecologically unsustainable practices, sale or breeding stock is sometimes known as erosive coping strategies (Ahmed and Abdel Ati, 1996). Strategies by their nature are likely to be more sustainable; the adoption of drought tolerant breeds and species of livestock is a case in point.

According to Fasil *et al.* (2001), adapting in contrast to coping means a permanent change in the ways in which food is required. Adaptation may take place after each period of severe drought as an attempt to recover after the crisis. When food insecurity has become chronic people might not be able to cope with the situation anymore. This might be the situation when pastoralists have lost their animals and hence their means of primary production. At this extreme, all behavior becomes coping. The behavior of pastoralists during widespread drought conditions, such as those of the

³ Adapting in contrast to coping means a permanent change in the ways in which food is required. Adaptation may take place after each period of severe drought as an attempt to recover after the crisis. When food insecurity has become chronic people might not be able to cope with the situation anymore. This might be the situation when pastoralists have lost their animals and hence their means of primary production. At this extreme, all behavior becomes coping. It is argued that this is the case in Borena where a combination of climatic conditions, civil war and impoverishment from repeated famines has rendered some groups incapable of surviving and dependent on relief aid (Fasil *et al.* 2001).

1970s and the 1980s, has been the subject for intensive research. In most cases, the focus has been on the different actions taken by herders with onset of drought conditions, on differences in the ability of particular groups of households to pursue different options and on the consequences of herd losses of different strategies. The strategies pursued by herders in the face of drought include: movement, migration in search of work by some household members, exploitation of alternative sources of income, sale of assets and livestock capital, farming, intensification of resource use and use of resources not normally exploited. Clearly, the following are examples, and not patterns of behavior, which occur always and everywhere in pastoral areas of Africa including the Horn (Coppock 1994; Futterknecht 1997; Oba and Lusigi 1987; Scoones 1992, 1994, 1996; Sommer 1998; and TDCPU 1992).

(1) Pastoral movement: Many writers note the increasing mobility of herders when faced with a shortfall in pasture resources. As a natural response to range heterogeneity, pastoralists move their herds sequentially across a series of environments such that each reaches its peak carrying capacity at the time of visit (World Bank Ongoing Operational Report, the Africa Technical Department, n.d.). Movement of herds in search of grazing, a pattern followed seasonally in normal years, is amplified in years of drought. The adaptive advantages of mobility for pastoral producers in areas of low and uncertain rainfall are obvious, herds being able to move to make the most of localized rainfall, avoiding the risk of relying on rainfall received within a confined area. However, the importance of mobility in minimizing livestock losses rests on making early decisions to migrate with animals, while still in reasonable conditions and before many of the transit zones being denuded by preceding herds. Of course, there are costs and uncertainties for herders moving into areas with which they are not familiar.

Many pastoralists faced difficulties leading their herds through agricultural areas before harvest had been completed. Pastoralists may also be forced to move to areas infested with tsetse fly and other parasites and where grasses may be unfamiliar to animals. There are examples of pastoral households that although they did not migrate, suffered very low rates of herd loss, apparently because they were able to make use of localized areas of good grazing of which other herders were not aware but sufficient enough to support a small number of animals over the drought period. Mobility is, however, affected by many factors, including the type of relations that exist between local groups which lives in or around drought refuge areas; long distance movement which results in heavy loss of livestock; the existence of livestock disease risks which delay movement to drought-refuge areas or result in heavy losses of livestock (Ali 1996; Oba 1997). The variations in the rates of livestock losses suffered by different households and ethnic

groups may be related to socio-economic factors (i.e. herd management practices, increased sedentarization, loss of territorial and political control, the abolishment of slavery and increasing dependence on other sources of income). Because of their great adaptability to changing conditions, the Mbararo (pastoral Fulani), for example, were able to respond with least difficulty to the drought because of their large household size, their political independence and their lack of territorial attachment.

Different patterns of mobility can also be attributed to the degree of involvement of various pastoral groups in farming. Herders who also farm tend to be slower to move, more reluctant to leave their fields until the harvest however meager is over. In some cases, animals were entrusted to other herders to be taken to more favorable areas, whereas in others stock were kept at the farming settlement, the herd-owner having too few animals to make up a viable herding unit to support a full-time herder. In the absence of possibilities for forming joint herding units with other households, the animals of small herd-owners must be kept around farming areas, subject to limited grazing resources and higher risks of drought than larger, more mobile herds (Holy 1988).

(2) Diversification of species: particular species of livestock will face different risks from disease, grazing scarcity, etc. By maintaining several species, herders can reduce the risk they face from any particular event. In addition, a mixed herd can make fuller use of an area of grazing than a single species alone. According to World Bank (n.d.), managing a variety of species helps to take optimal advantage of the heterogeneous nature of ecosystems. The pastoral strategy is to use a broad array of species (cattle, camels, sheep and goats), which utilize different parts of the forage and have varying resistances to drought

Mace and Houston (1989) predict that in order to maximize household survival chances, poor households should keep only small stock. But after the total herd size increases to a certain level, it becomes beneficial to exchange many, if not most, of the small stock for camels. The herd size at which the switch to mixed camel and small stock herding becomes optimal is shown to depend on, beside the local environmental parameters, the household's food and income needs and the contribution that an animal of each species makes towards meeting those needs, and it generally occurs well above the minimum wealth at which one camel could theoretically be bought. The proportion of the household's livestock wealth that should be kept in camel after this 'up-stocking' into camels is shown to depend on the drought susceptibility of each species, but particularly small stock, and also on their relative prices or exchange rate. These predictions are based on the assumption that herders actively manage the species composition of their holdings, either by exchanging species directly or preferentially selling or slaughtering one species more than another when providing for household needs (Mace and Houston 1989). Mace (1990, 2) identifies three classes of

years: normal years, minor droughts and major droughts. Major droughts are assumed to occur roughly one year in ten. Of the remaining years, one year in three or four is a minor drought. This is the pattern that could be described as typical of the semi-arid parts of the Sudan for example. In minor droughts, small stocks usually do not rear young successfully. Under such conditions small stock herd size tend to decline, while camel herds are not affected. In major droughts, neither camel nor small stock young survive and adult mortality also increases, but much more severely in small stock than in camels (Mace 1990).

(3) Herd splitting and distribution/exchange: In this case, animals may be kept in several different areas, which given the common occurrence of local droughts, will reduce the impact of this on total holdings. This involves dividing their livestock into small herds grazed separately and by prioritizing milk animals or some other category. In addition, animals may be distributed through loans and exchanges with other herders reducing the effects of localized droughts, raids and diseases on stock and at the same time creating and re-enforcing social ties between households. However, this is rapidly changing, as livestock are becoming more marketable and family labor is being replaced by wage labor (Oba 1990).

(4) Expansion of herds and changing species composition: It has been widely remarked that a major strategy by which herd-owners attempt to protect themselves against the worst ravages of droughts and epidemics is that of expanding their livestock holding on the principle that quantity provides the best defense against heavy losses. As a long-term strategy for coping with drought pastoralists, among others, change the species composition of their herd. This takes place among species that have different reproductive rate, mobility style and feed habit. However, changing the species composition of herds has some limitations, if pastoral communities need to generate cash from time to time. For example, the market for camel is often much less developed than the market for cattle or sheep (Assefa 2000; Ali 1996).

(5) Dispersal of resources and assistance from relatives: These include herd and family splitting, temporary migration, transfer of animals within social networks (whether with kinship basis, or with stock associates) on which individuals have legitimate claims, resource sharing (e.g. circulation of milking animals) (Sommer 1998, 11).

(6) Forage supplementation: This includes preparation of hay, lopping of trees (leaves, fruits, branches), supply of commercial forage supplements, etc. (Scoones 1994; Sommer 1998).

(7) Generation of food stores: This includes cereal stores to prevent distress sales of livestock; stores of milk, meat, fat, wild fruits, and others (Sommer 1998, 11).

(8) Sale of non-livestock assets: Selling non-livestock assets such as gold and other non-productive capital can help bridge a temporary shortfall in subsistence supplies. Well-to-do pastoralists are usually in a better position as they have certain assets that may be sold to provide funds for buying grain and therefore postponing the moment at which they will be forced to sell productive capital such as livestock. The sale of female stock during drought represents disinvestments in productive capital and hence a setback for rebuilding a viable herd after the drought is over.

(9) Income generation from non-pastoral activities: Subsidiary sources of income have been of varying importance for different pastoral groups and households, providing additional revenue in normal times and a fallback source of subsistence during times of crisis. However, it may be the case that these auxiliary activities, e.g. gathering of wild food, availability of wage earning opportunities, etc., are themselves adversely affected by drought conditions. Many bush products (e.g. grasses, berries and roots), whose productivity is likely to fall in time of drought, may not be available and therefore be less able to play a major role in providing pastoral households with additional subsistence. In general, some of the major strategies used by pastoralists with regard to diversification of incomes include: charcoal making, hunting, food gathering, fishing, petty trades, working in urban areas, and migration to neighboring countries for labor (Dalol 1992; Futterknecht 1997; Scoones 1994; Ali 1996; Sommer 1998).

(10) Reduction of food intake and change of composition of diet: The immediate impact of drought is decline of the supply of milk, which is the most important source of calories in the pastoral areas. During the drought pastoralists take more cereals than milk and reduce their food intake. According to Coppock (1994, 163) during the 1983-86-hunger period, pastoralists in the Borena area compensated for reduced food production through four ways and three of them are related to household diet adjustment. These are: (i) giving priority to young children to receive milk; (ii) shifting diet composition for other age groups to include more cereals, meat and blood to accommodate the needs of children; and (iii) reducing the size and frequency of meals to adults and older youths⁴. It was also observed that in some instances households gather wild foods (Futterknecht 1996).

In looking at the actual effects of drought on pastoral communities account must be taken of not only how far these strategies have been changing in a

⁴ The fourth response adopted by the households due to reduction in food production is 'sending the elderly or other volunteers to famine relief camps as a last resort' (Coppock 1994, 163).

way that increases the vulnerability of particular households and groups, but also which households are best able to pursue such strategies, thereby affording themselves greater protection from drought. For example, the parallel maintenance of different species in separate herds will be less easy for some households to achieve, given shortages of labor and limited labor-sharing arrangements with other households. Richer herd-owners may be better able to attract extra-household sources of labor and to reduce risks from localized droughts by a strategy of herd dispersion, diversification and distribution. Similarly, large households will be better able to diversify the activities of their workforce into other income-generating pursuits since constraints on labor availability will be less severe.

Overall, the literature on the behavior of pastoral groups in time of drought shows the wide range of strategies adopted to cope with drought by different pastoral groups in the Horn of Africa. The importance of different coping strategies varies between regions and households according to the resources available to them. These variations and the associated responses have vital bearing on the consequent variations in the capacity of pastoralists to livestock and income recovery in the post-drought period. However, Coppock (1994, 165) indicates that the literature is by and large of the opinion that “traditional pastoral societies are increasingly unable to cope with drought, as indicated by large losses of herd capital, widening poverty and frequent famine.” He further mentions that “traditional pastoral systems are thus thought by many in the process of gradual destruction through the combined effects of internal and external forces exacerbated by drought.” This would suggest, among other things, the role of external agencies in helping pastoralists to cope with drought.

3.5 The role of external agents in coping with drought

Helping pastoralists cope with and recover from both environmental and man-made hazards have been major focus areas of governments, NGOs and UN agencies. Government and non-government agencies intervene in various direct and indirect ways in order to help pastoralists cope with drought. Direct forms include, among others, food aid to save lives and relieve pressure on livestock; provision of credit to fund purchases of cereals; and subsidizing livestock prices to mitigate the drought induced pastoral terms of trade decline. The indirect role of external agencies in drought coping is in areas of risk management activities including developing an effective early warning system, improving infrastructure to increase off-take, and designing asset diversification mechanisms. Depending on the specific situations of each pastoral community as well as each household in each community, external intervention in this case could help pastoral households in various ways. Sommer (1998) summarized

(from various sources) possible options for external interventions during and after-drought as follows:

1. *Support in movement of livestock*: provision of information where forage is available; management of conflict concerning access to key resources (water points, forage); provision of transport infrastructure;
2. *Support in marketing of livestock*: to ensure purchasing power and avoid waste of assets;
3. *Subsidies and price control*: to ensure pastoralists a minimum of purchasing power in the context of selling animals, buying food;
4. *Health and nutrition support*: to control disease outbreaks and to protect nutrient status of vulnerable groups;
5. *Provision of credit*: to fund purchases of cereals, and avoid unnecessary sales of livestock in order to allow herders to buy their own fodder;
6. *Veterinary campaigns*: to avoid large-scale livestock deaths as a result of outbreaks of contagious animal diseases during drought;

Successful coping through external intervention, generally, depends on how effective the drought is managed which in turn calls for the combined effect of certain necessary conditions. Birch and Shuria (2001, 94) identify four key components that are required for effective drought management. First, an early warning system which is relevant, transparent, trusted, and able to trigger timely action. Second, a package of flexible responses appropriate to each stage of the drought as it evolves. These responses may include support for activities like marketing and livestock off-take, water development, livestock health, public-works schemes, cereal stocks, food aid, and initiatives to promote post-drought recovery. Third, the resources and political will to put all the above into practice. And finally, the mechanisms which can hold those in authority accountable for their actions, such as independent media or district-level representative structures.

Drought coping interventions in the pastoral areas by external agents are not without problem, however. For example, according to some studies, food aid may affect the long-term sustainability of the system. In this regard, Helland (1997a) argued that food relief in Borena pastoral economy allowed non-viable households to maintain themselves in the pastoral sector and subverted the need to destock, which is nature's way of restoring balance to the eco-system.

The effort to support coping strategies, drought resilience and post-drought recovery depends on various factors:

1. Lack of understanding of the main characteristics (orientation toward livestock, physical properties of pastoral environments, and geographical location) of pastoral societies (see Hogg 1997);
2. The structural or institutional context and policy issues of government in a drought period are of crucial importance;
3. The culture of a particular group also affects the mode and ability of the group to effectively respond to drought;
4. The consequences of drought are often compounded by other factors such as civil unrest, a large influx of refugees;
5. Poor early warning programs in pastoral areas. The options for intervention depend very much on how early the first signs of stress in the environment are picked up by planners; and
6. Large-scale and untargeted food aid. Helland (1997a) has argued that putting food relief has undermined the long-term health of the Borena pastoral economy as it allows (i) non-viable households to maintain themselves in the pastoral sector supported by external relief/subsidy and (ii) it subverts the need to “destock” which is nature’s way of restoring balance to the ecosystem.

Hogg (1997b) concluded that the impact of drought is never uniform but strikes differently, both within and between different pastoral societies, depending on their differential access to natural resources, political power and the market. An understanding of the matrix of vulnerability of each group is a pre-condition for effective drought contingency planning.

Studies show that both pastoral and assisted coping strategies can only be regarded as only forced temporary solutions to the problem, not improvements. As argued by Coppock (1994, 11) such practices as “agro-pastoralism, herd diversification and peri-urban dairy marketing have evolved in East Africa because of extreme pressure on the traditional livestock systems as a result of human population growth.” Therefore, these indigenous mechanisms do not “necessarily represent improvements in human welfare or an enhanced system state.” According to this view therefore the existing circumstances in the region under consideration suggest that households are better off if they can recover from drought and stay in the pastoral activity.⁵

⁵ This doesn’t mean that there are no instances where some pastoralists preferred other activities, although the options were not sustainable. For example, Assefa (1996) indicated the case where some pastoralist in Afar who migrated to other places in search of other employment refuse to go back to pastoral activity after having a different experience. He said that “most of the returnees do not want to return to

4. POST-DROUGHT RECOVERY STRATEGIES

In the inter-drought cycle, the post-drought recovery phase comes between the drought period and the high-density phase. This period is important in countries where other employment options are limited and hence pastoral emigration out of the system is difficult. During the recovery period, pasture and water availability in the area reaches its height but most of the households have already exhausted their livestock (see also table 7 above). Thus stocking rates are low particularly in terms of large ruminants, and the need for breeding stock by pastoral households is high. Pastoralists and external agents respond to the situation in a variety of ways. Section 4.1 summarizes pastoralists on recovery strategies. Section 4.2 summarizes the role of external agents during this period. Finally, Section 4.3 outlines the constraints.

4.1 Pastoralists' own Recovery Strategies

Only very few studies of pastoralism in the Horn of Africa put emphasis on post-drought recovery strategies. One important study in the Horn of Africa region is by Coppock (1994), which analyzed the Borena predicament in 1985-87 in relation to a recovery from the drought of 1983/84. According to this summary, the recovery period was characterized by: (1) increasing rates of milk output per unit area due to a growing stocking rate of cows; (2) aggressive and opportunistic production values being manifested by households seeking to rapidly rebuild their cattle herds; (3) intensive efforts to cultivate cereals to make up for milk deficit per unit area; (4) extensive recovery of the grass layer from previous heavy grazing, the extent of recovery being dependent on rainfall; (5) increased sales of milk from peri-urban households needing grain to cover large deficits in food energy; (6) increased sales of small ruminants to buy food grain; and (7) traditional groups being honored allowing unrestricted access.

Pastoralists in the Horn of Africa and elsewhere pursue a variety of strategies to re-build their herds after drought. The available studies reveal that the following are among the major post-drought recovery strategies used by different pastoral groups in the Horn of Africa.

(1) Recovery in the system by restocking: Blench and Marriage (1999, 20) argue that restocking⁶ although “usually thought as something penetrated by agencies” is widely practiced by pastoralists themselves.

their former occupation because they find it difficult to adapt to life in their village since they had a relatively better standard of living while they were in their place of migration” (p. 158).

⁶ Restocking involves the provision of livestock to families who have lost their herds, usually as a result of drought, disease, or conflict. It is normally complemented by food ration to sustain the lives of restockees until they start to reap the proceeds of their livestock (Birch and Shuria 2001, 46).

According to them, pastoralists “prepare for drought and epizootics by “lending” their animals to relatives or friends in exchange for looking after some of their animals in return.” They also indicated that cattle-raiding in some places is “one method of restocking a herd.” They, however, mentioned that this type of “traditional” recovery mechanism is not usually advocated by aid agencies. Following Horowitz and Little (1987), Blench and Marriage noted that “diversification of income, or engagement in temporary paid labor is an indirect means of restocking” (Blench and Marriage 1999, 21). Put another way, “money gained in other sectors can be channeled into pastoralism, particularly after a drought when animal numbers are low and prices are high.”

(2) Sedentarization and farming: The issue of sedentarization of pastoralists has always been a subject of debate between researchers and governments. African governments are hoping that pastoralists can be sedentarized as quickly as possible, making them amenable to the types of service delivery system used for dealing with agriculturalists. However, researchers are of the opinion that sedentarization will have a very negative effect on pastoralism and animal productivity (Morris 1986). Nevertheless, we see that sedentarization of pastoralists is evident in pastoral areas in an increasing rate even without governments’ intervention. In the period following drought, pastoral households commonly adopt farming as a temporary measure, with crops providing a source of subsistence and a possible source of surplus with which to rebuild the herd. Whether this strategy does in fact allow the household to be reestablished as an independent herding unit depends on the environment in which it finds itself and the constraints that it faces in combining farming with herding. Many households may adopt farming as long-term strategy (Holy 1988), the security of being able to satisfy at least some of the household’s grain requirements more than offsetting the probable lower returns to livestock keeping under more sedentary conditions. Where alienation of former pasturelands is also tending to reduce the viability of exclusive dependence on livestock, households may turn increasingly to farming to gain some security of tenure over land, in addition to supplementing declining productivity from their herds.

Some examples of sedentarization into cultivation as a response to the drought of the 1970s are reviewed by Toulmin (1983), and the dry years of the 1980s have provided further instances. Even pastoralists from groups that historically did not farm have been taking up farming during the more recent droughts. Zeyadiya pastoralists and neighboring nomadic groups took the unusual step of cultivating millet after the early 1980s drought in Darfur, Sudan (Holy 1988). De Waal (1989) reports that some pastoralist

Zaghawa from North Darfur have moved hundreds of miles to wetter areas in South Darfur to farm.

As has been noted in the literature (Barth 1961; Baxter 1975; Salzman 1980; Azarya 1993 as cited in Azarya 1996), permanent settlement of pastoralists tends to follow either excessive poverty or excessive wealth. It has been further argued that in the case of poverty, measured in loss of livestock, pastoralists are forced to settle among agriculturists and start cultivation. In the case of wealth, prosperous pastoralists acquire land and have it cultivated by hired hands or dependants of various sources. These groups remain pastoralists in the sense that they continue to own and show a considerable interest in large herds of livestock even after a drought period. The poor ones, however, could not escape the necessity of becoming sedentary agriculturists since they did not have enough stock to ensure their subsistence (Azarya 1996). Following Salzman (1980) and Barth (1961), Azarya (1996) summarized the five models indicating various processes of settlement of nomadic pastoralists as follows:

- In the “drought and decline” model, pastoralists lose their animals to the vagaries of climate, diseases, absence of water and pasture, and they have no choice except to retire to agricultural villages.
- In the “defeat and degradation” model, the pastoralists are defeated militarily and their stocks are taken away from them, thus being forced out of nomadic life.
- In the “failure and fall away” model, while the pastoralist group, as a whole, remains viable, some households among the group are unsuccessful in maintaining a viable productive unit, cannot support themselves through pastoralism and thus drop out of the pastoral sector.
- While the above three models all derive from failure, the fourth model is based on excessive success. In the “succeed and surpass” model, individual pastoralists build such large herds that they can convert some of the wealth in livestock into wealth in land. These individuals are dropping out of the nomadic sector and moving into the settled sector but rather than “going under” they are “going over”, becoming land owners and part of the local elite.
- The alternative model suggested is more general and open-ended referred as “adaptation and response” model. It is not specifically linked to any political circumstances and it is formulated at a broader analytical level than the other four explanatory models. Its main purpose is to show that sedentarization is not irreversible, that it is not over burdened by cultural restrictions and that it is a more instrumental response to perceptions of changing constraints both internal and external to society.

(3) Mobility for wage labor: Those pastoral households who are unable to be reestablished in the pastoral sector migrate to other places looking for employment or relief assistance. In this case, these groups may go to work for other herd-owners; look for employment outside the pastoral economy; and stay with relatives that have been less badly affected by drought or seek support in famine relief camps. The receipt of famine relief can provide a breathing space for the re-establishment of herds by providing the subsistence requirements of part of the household and thus reducing demand on milk supplies. Migration by some household members to earn income elsewhere in irrigation schemes, plantations and towns is an important universal strategy during drought. Pastoralists wage labor migration seems to increase from time to time. In this regard, for example, Egeimi (1996, 38) mentions the case of Hadendowa pastoralists in Sudan, who are nowadays considering this strategy as an important outlet. He writes that migration for wage labor, which was not a tradition before, has now become increasingly significant for the Hadendowa local economy. Similarly, according to Fasil *et al.* (2001), the Afar and Borena pastoral groups of Ethiopia diversify their income during food shortage by creating employment opportunities for the youth in non-pastoral activities or by sending part of the household (young men) in nearby towns or to other foreign countries. The Afar usually send their young men to Saudi Arabia, Djibouti and Yemen; the Borena youth migrate for labor to Kenya. This helps in the reduction of number of people from each household and in getting additional income for the family from labor. There is also a sense of optimistic hope that the people who leave for good will eventually settle and be successful in generating enough income to support their family back home.

(4) Small-scale business: Pastoralists recover from drought by involving in non-pastoral activities, the most common of these in the Horn of Africa is a petty-trade business. The unofficial cross-border trade in Eastern and Southern Ethiopia involves a number of people from the major pastoral groups including the Afar, the Borena, and the Somali. Due to the fact that the pastoral areas are unable to provide employment opportunities in other sectors, the unofficial cross-border trade in the Horn of Africa appeared to be the only way out from the pastoral sector (Assefa 1996; Little 2000 & 1998; Tegegne *et al.* 1999). In addition, the Afar pastoral people tend to diversify their income by involving in salt production and trade activities especially in Berhaile and Afdera areas. There is also attempt to involve in salt production and trade in Borena. Pastoral/agro-pastoral women also diversify their income in response to drought by involving in petty trade activities and in small-scale handicrafts (Fasil *et al.*, 2001). Generally, however, activities other than pastoralism and agriculture are not usually available. For example, in their recent field report, Sandford and Yohannes

(2000) indicate that many pastoralists in other countries of Africa, and particularly in recent years, diversify their economic activities outside pastoralism and agriculture in order to spread the risks of natural and man-made disasters. However, they indicated that none of the major pastoral groups in Ethiopia seem to have succeeded in diversifying their activities to a significant degree outside the agriculture. The reasons for this failure are yet to be identified.

Under traditional systems, *coping strategies during drought* such as mobility, species diversification, stratification or stock lending (Grandin and Lembuya, 1987) have been capable of keeping a majority of the herders in a position where they could return to herding even after a severe drought (Ellis 1995). For example, during the 1982-84 droughts the Afar pastoralists in northeastern Ethiopia migrated to relief centers in Mekelle. But some people left young men behind to take care of few breeding herds to be used for restocking purposes after the drought. Those herders were provided with relief food from the family members who migrated to relief centers. As a result, some pastoralists managed to maintain few animals after the acute drought (*Keda 77*) of the 1982 to 1985, and the average drought (*Unda 77*) of 1993/94. For instance, one clan leader from this area managed to remain with 35% camels, 50% goats, 15% cattle and 0% sheep after the acute drought of 1982 to 1985, while many others lost many or all of their animals (Fasil *et al.* 2001). Dyson-Hudson (1972) indicated that such strategies have become of limited significance with the progressive influence of external factors (such as road, health and water infrastructure development, micro-economic and price policies, trade and tariff regulations).

Local recovery strategies of pastoralists also depend on the particular situation of each household. In general, after the rains break, pasture condition recovers quickly and livestock prices rise, partly due to the general shortage of livestock on the market. However, during the drought as calving rates plummeted and many of the reproductive animals died, herd recovery will take several years. As the terms of trade change, those herd owners who have retained livestock will continue to need support, without which they will have to sell their remaining livestock. Those with access to farm plots are better placed as they can depend on their own harvests. Others will be forced to turn to alternative income opportunities - charcoal burning, woodcutting, etc to eke out a living. Many, of necessity, will need to depend on external assistance during the slow process of herd reconstitution (Hogg 1997a). Options for intervention during this phase of the drought cycle range from those aimed at rehabilitation of the pastoral sector by enabling the destitute to re-enter pastoralism and by reducing pressures on herders' incomes, to those aimed at encouraging a major shift to other forms of livelihood, such as irrigation agriculture and labor migration.

4.2 The Role of External Agents in Post-Drought Recovery

Morris (1986) suggests donors and African governments to consider recovery after drought continually as a central issue for improving the livelihood of people repeatedly affected by drought. It is further argued that the key policy issue is how to get households out of a situation of continuing dependency as rapidly as possible. Toulmin (1986), in her review of policy options for African governments, indicated that establishment of expensive small-scale irrigation schemes in response to drought are less cost effective than to provide other options such as restocking. However, with the exception of few attempts by some NGO interventions, attention was not given to these proposals. The post-drought recovery period has seldom been adequately addressed in relation to the emergency measures adopted during the drought period. In deed, the role of external agents in post-drought recovery begins with the various efforts they could extend to help pastoralists cope with drought. The way interventions are managed during drought highly determines the situation in the post-drought period. It is difficult to clearly demarcate between the intervention that exclusively copes with drought and the one that addresses the post-drought recovery only. For example, Coppock (1994, 260) argues that “setting major projects aside in bush control for times of drought not only provides jobs and income during the hard times, but may also prepare range sites for faster rehabilitation during the drought recovery phase of the cattle production.” Therefore, most of the kinds of external interventions as well as pastoralists own coping mechanisms mentioned in earlier sections of this report need to be recognized while considering addressing the post drought predicament of pastoral households. Similarly, some possible interventions required during high-density phase particularly those involving alternative forms of asset accumulation through banking of livestock capital can facilitate recovery in the post-drought period.

The remainder of this section summarize additional roles of external agents in the post-drought recovery period including instituting effective early warning systems, promotion of development activities suitable in recovery phase, and assisting those households who should emigrate out of the system and accommodated in other sectors.

(1) Instituting effective early warning systems: The first major impetus to establish early warning systems (EWS) in Africa came after the famines of the early 1970s in the Sahel, which the international community failed to recognize in time. EWS were set up mainly to serve donor and UN food aid institutions. This is still the primary purpose of many EWS. The pastoral sector has been largely ignored in EWS. Most of the EWS focused on monitoring rainfall and crop production and only a small degree of attention is paid to production determinants of the pastoral economy.

Pastoralists' (and also farmers') ability to cope with drought depends not only on the supply of relief goods and services but also resources which effectively enhance their livelihoods. Therefore EWS must also monitor determinants of entitlements. So, the starting point in designing an Early-Warning System is to focus on how pastoralists pursue their livelihoods rather than on how they fail to do so. It must not only be capable of warning of large-scale famine, but also be sensitive to changes in livelihood security status long before famine threatens.

An Early Warning System is a system of data collection to monitor pastoralists determinants of entitlements in order to provide timely notice when drought stress occurs and thus to elicit an appropriate response (Buchanan-Smith *et al.* 1991a as cited in Sommer, 1998). One point to consider is that the range of indicators which can be used in EWS are constrained by the characteristics of the institutions which undertake early warning and analysis. Given the complexity of local conditions, centrally-based EWS cannot obtain the necessary level of detail to adequately assess reported changes in pastoralists' livelihoods. Their limited access to local level information sources and limited understanding of local conditions precludes the effective use of data sources such as household behavior. If an EWS wants to contribute to saving livelihoods, it needs to detect stresses on livelihood security, i.e. changes in the determinants of entitlements.

Fasil *et al.* (2001, 43) summarize how EWS developed in Ethiopia from unpublished report of Disaster Prevention and Preparedness Commission (DPPC) as follows:

Following the shocking experience of the 1972/73-drought, the EWS as a mechanism for information gathering, processing and analysis came into being in Ethiopia. The National EWS, as a mechanism, has since then played a crucial role in all disaster management of the country.... This program was established to monitor various indicators affecting rural livelihoods. The purpose of continuous monitoring is to provide warning on the threat of disaster ahead of time to trigger timely appropriate and preventive measures.... The system operating at all administrative levels and DPPC serves as the secretariat of the committee. The members of the committee include Ministry of Agriculture (MOA), Ministry of Health (MOH), Central Statistical Authority (CSA), Ethiopian Mapping Authority (EMA), National Meteorological Services Agency (NMSA); and DPPC. Most of the information is based on qualitative information on crops. General information on pasture, browse and drinking water availability, animal health, herd movements, terms of trade and patterns' of pastoralists' movements and data on livestock production are collected for monitoring the welfare of pastoral communities.

The DPPC report also indicated that the system appears to continue in the years ahead with little or no significant improvement due to the following weaknesses:

- Lack of confidence on the system due to doubts on the reliability of the information released;
- Lack of transparency and objectivity in the methodology for estimating requirements.
- Lack of reliable baseline data that are useful for the interpretation of early warning indicators;
- Inadequate institutional information flow; and
- Low staff motivation, etc.

Fasil *et al.* (2001) also report that there is no regular data that comes monthly from the districts in pastoral areas of Ethiopia since there is no organized body to collect data. Rather, assessment is made twice a year during the short and main rainy seasons.

Although drought is a recurring situation in pastoral areas of the Horn, the peoples' drought coping mechanisms seem not fully understood by governments and NGOs and are not well integrated into formal drought-mitigating strategies. In addition, the response to identified early warning indicators are not timely. EWS are the means of detecting stress on livelihoods and of providing timely information for decision makers before lives are threatened. Early warning, which seeks to detect stress on pastoralists' livelihoods, requires its own design. The majority of current EWS are neither capable of detecting stress on livelihoods in general nor of paying attention to early warning and response requirements of the pastoral sector.

Information about how pastoralists respond to declining livelihood entitlements can be of great use in the context of early warning and response. Pastoralists respond to drought related decline of entitlements with the changing of their livelihood strategies, such as herd management and diversification of income, in order to improve livelihood security. The sequential ordering of pastoralists' changes in livelihood strategies to intensifying levels of drought stress suggest that the behavior itself can be an important indicator for EWS purposes (Raiely 1992). The relevance of such an approach has been shown through changes in market prices which are initiated through pastoralists' response to drought stress. Clearly, other changes of pastoralists livelihood can also be used for EWS purposes. Examples of pastoral behavioral indicators include (Sommer 1998, 23 adopted from Raiely 1992; TDCPU 1992):

- **Herd management:** movement of herds, herd splitting, herd composition, sales and slaughters,

- *Employment and migration patterns*: changes in number or demographic, composition of migrants, changes in timing and destination, changes in wages and unemployment levels.
- *Marketing patterns*: livestock and grain prices, changes in supply and demand; marketing of other household assets, such as jewelry or cookware;
- *Income generating activities*: collection of firewood, production of charcoal, gathering of grass and crop residues, fishing, hunting, work in urban areas; and
- *Others*: generation of food stores, preparation of hay, etc.

The collection of data on behavioral indicators needs to encompass a wide sample of households in order to differentiate responses across pastoral groups. The use of behavioral information is not entirely straightforward. It requires a detailed understanding of the local conditions affecting pastoralists' livelihoods. Fasil *et al.* (2001, 48) identify indicators in response to early stages of drought in Afar and Borena pastoral areas of Ethiopia which could be also used as an EWS. The indicators included:

- Reduction in number of meals per day and little amount per meal;
- Unusual food items in the households such as wild fruits, tubers;
- High livestock supply to the market especially young male calves and even breeding animals and lower livestock prices;
- Unusual sale of firewood and charcoal by pastoralists /agro-pastoralists;
- Labour migration to neighbouring countries;
- Resource assessment (grazing, water, etc.);
- Split herds;
- Collect feed or hay;
- Sell and slaughter young male animals;
- Assess market situations; and
- Collection of wild fruit.

Sommer (1998, 37) also suggests four areas which need to be addressed in future research concerning early warning and response for the pastoral sector: firstly, monitoring and effective intervention with regard to access to key resources for pastoralists during drought; secondly, cost effectiveness of different indicators and forms of interventions; thirdly, institutional requirements for efficient generation of local level information and effective local level interventions; fourthly, minimizing of conflict in early warning and response capacities.

(2) Assisting asset recovery by restocking and promotion of other development activities: The most common intervention area by external agents in the post-drought recovery period is restocking or livestock supplementation. In the 1980s and early 90s, an increasingly popular form of intervention was re-stocking. The emergence of restocking as a serious response to pastoralist destitution was closely linked to the more general shift in the 1980s in the range development paradigm - from an emphasis on ecological equilibrium to an emphasis on contingency and variability (Hogg 1997a).

Unlike emergency destocking, to which it is inevitably linked, there is considerable literature on *restocking* (see among others, Hogg 1997a; Behnke and Scoones 1993). The argument advanced for restocking is based on three pillars (Hogg 1997a, 16). First, after the “*crash*” there is a surplus of grazing available, which should be put to good use. Unless it is used it will deteriorate in quality, often leading to “green desertification” (bush encroachment). Second, the costs of alternative development interventions in pastoral areas, such as irrigation agriculture, are extremely high and experience has shown often unsuccessful. Finally it is a waste of human resources for destitute pastoralists to languish in famine relief camps. These groups have in fact particular skills, which could be put to use back in the pastoral sector.

However, the high cost of the program as well as its feasibility in the face of frequent drought appear to discourage external agents to implement restocking as a post-drought recovery strategy. According to Hogg (1997a, 16-17), the modalities adopted by different intervention agencies have varied substantially depending on their specific situations but in most cases the programs involved “relatively few pastoralists as they are expensive to implement.” Birch and Shuria (2001, 46) also note that re-stocking is an intensive intervention which in practice can directly benefit only a small proportion of the population.

In addition, external agents could promote a number of other activities which have high probability of success under low stocking rates depending on the specific conditions of each pastoral community. For example, for the case of Borena, Coppock (1994, 266) identifies several development windows including site reclamation, improved calf management, sustainable cultivation, milk and small ruminant marketing.

(3) Facilitating employment options in other sectors: Traditional pastoral production systems, no matter how efficient they may be, are increasingly failing to be sustainable owing to continual resource shrinkage caused by rangeland degradation (Ngaido *et al.*, 1998, 71). One possible implication of this phenomena is that it takes only a very short period of time for

pastoralists to move from low stocking rates to high density phase scenario, at the community level, resulting in further degradation and shrinkage and ultimately a pauperization and destitution of pastoral households. This situation challenges both own and assisted household recovery in the pastoral sector. Thus, in order to compensate for the reduced income, pastoralists would seek employment in other activities. External agents could therefore play vital roles in helping pastoral households in handling better the case of emigrants out of the pastoral system.

4.3 Factors Affecting Post-Drought Recovery Strategies

Post-drought recovery strategies by pastoralists and external agents are being undermined by continual resource shrinkage as a result of several economic, political and social changes, such as growing populations, urban expansion, expansion of cultivation, political instability, economic stagnation, land tenure disputes and settlement policies. Although the majority of the population of pastoral areas depend on pastoralism and to some extent on farming for subsistence, these areas exhibit ecological constraints which set limits to those activities (Salih and Ahmed 1993). Besides the ecological problems and repeated drought occurrence, policy related constraints put constant pressure on their livelihoods and their ability to recover from drought crises (International Institute for Sustainable Development 1999). As identified by different studies, the various constraints that challenge recovery strategies in different pastoral areas of the Horn include: (1) Expansion of agricultural projects; (2) Expansion of wildlife parks and sanctuaries; (3) Expansion of agro-pastoralism; (4) Encroachment of the rangeland by unwanted species; (5) Insecurity; (6) Population growth; and (7) High drought frequency.

(1) Expansion of agricultural projects: This refers to the conversion of prime traditional dry season grazing areas to large-scale irrigated agriculture. This has been a common practice in many parts of the Horn of Africa sub-region. This attempt primarily targeted the reverine areas that are vital for dry season grazing. For example, the Afar pastoral groups in the Awash valley, Ethiopia, have lost close to 23 thousand hectares of grazing land that has been caused by the direct encroachment of irrigation schemes. This land, during the dry season, could have supported 16,100 TLU which accounted for 25% of the total livestock population of the study area (Ali 1997, 126). In addition to reduction of dry season grazing land, irrigation schemes affected the pastoral production system by preventing flooding in the plains and by increasing the incidence of diseases as well as toxicity and salinity of the soil (Ibid 127). Another study on Afar pastoral groups shows that pastoralists have lost close to 50-60 thousand hectares of grazing land for various plantation projects since the last 50 years (Biruk 2000). Using the current carrying capacity estimate of 1.37ha/TLU, this prime rangeland could have supported about 82,200 livestock units and

contributed to the availability of additional feed source and improvement of the rangelands.

(2) Expansion of wildlife parks and sanctuaries: This refers to the conversion of prime traditional wet season grazing areas to wildlife parks and sanctuaries without the consent of the pastoral community. Once they are established, pastoralists do not have the access and benefit from the parks and sanctuaries. Moreover, they limit mobility and reduces feed source for livestock. A total of 353,730 ha of prime traditional grazing land has been converted to wildlife parks, reserve and hunting areas. Taking the current carrying capacity estimate of 1.37TLU/ha, this prime wet season grazing area can support an average of 484,610 livestock unit. This could have equally contributed to the feed source and improvement of the rangelands.

(3) Expansion of agro-pastoralism: Although agro-pastoralism could be considered both a response to food insecurity and economic diversity, it induces rangeland shrinkage and hence disruption of recovery in the pastoral system. The practice encourages sedentary farming and privatization of land. This challenges drought coping and recovery strategies of pastoral households whose livelihood is mainly dependent on nomadic pastoral production. In several pastoral areas of the Horn, agro-pastoralism has been spreading into purely traditional pastoral dry season grazing territories in the last 100 years. For instance, in many places of the pastoral areas of Ethiopia this practice came with the advent of large scale irrigated projects and/or the encroachment by migrant cultivators from the neighboring highlands.

(4) Encroachment of unwanted plant species: Encroachment of unwanted plant species into the prime rangelands is contributing to the on-going resource shrinkage and feed shortage. For instance there is invasion of introduced species of *Prosopis juliflora* in pastoral rangelands of the Horn of Africa region. Its introduction as a drought period livestock supplement feed is aggressively claiming prime irrigable area and rangelands adjacent to farms and water points.

(5) Insecurity: Pastoral areas of the Horn of Africa have now become insecure as a result of a number of factors that made these areas susceptible to violent conflict. Mkutu (2001) mentions that violent conflict in the pastoral areas can be caused and aggravated by a number of factors including the existence of intensified cattle rustling; small arms proliferation; inadequate state security policies; weakening, undermining of, or inadequate engagement with, traditional governance systems; inappropriate government development policies; inadequate land tenure policies; political and socio-economic marginalization of pastoralists; and

inadequate arrangements to cope with drought. Facilitated by one or more of the aforementioned factors, inter-ethnic and inter-clan conflicts over key rangeland resources mainly grazing land and water points are now increasingly becoming a routine event in pastoral areas of the Horn of Africa. They often involve a considerable loss of human life, property and displacement of people as well as resource shrinkage. Ahmed (2001, 76) mentions the case of Sudan and indicates that “the shrinking of land resources used by pastoralists and agro-pastoralists has been accentuated further by instability created by conflicts and civil wars which are becoming a major feature in the region.” Another example from Ethiopia shows that competition and ownership over resources between the Afar and the Issa clan of Somali have precluded about 75,000ha of prime wet season grazing land in the Halidege plain. This is also common among the Afar clans and other clans of Amibara district and the Middle Awash. An example of such a conflict is between Harkamella – Fediha and Sidiha Burra, both belonging to the Debine clan, that occurred in 1989 resulting in the death of 28 people from both sides (Getachew 2000). The situation generally imposes constraints on several coping strategies. Pastoral mobility, external relief and development interventions are highly affected by the conflicting environment (Futterknecht 1996).

(6) Population growth: In the past, this was assumed to be quite low among the African pastoral societies (Helland 2001, 72). However, several studies indicated that population growth has now become a major problem in pastoral areas. In the case of drought, it is now increasingly challenging the coping and recovery strategies. In the southern rangelands of Ethiopia, for example, Coppock (1994, 275) indicates that human overpopulation is the greatest challenge in the area. He indicates that “population growth has begun to swallow up traditional grazing reserves and related resources which used to promote stability under drought perturbation.” Population growth brings about a decline of per-capita cattle holdings, and during recovery “fewer households will be able to return to the system” (*Ibid* p.276).

(7) High drought frequency: the current situation in the pastoral areas of the Horn of Africa is closely associated with recurrent drought, and recovery by pastoralists and external agents are challenged. For example, in the case of restocking by external agents, Hogg (1997a, 17) comments that, “restocking may be a popular intervention with pastoralists but it only offers hope to a small number and, even these, are unlikely to survive subsequent droughts. The reality of pastoral areas is that ‘crashes’ are an inevitable aspect of life, and, while restocking may offer temporary respite for several years, most restocked families will succumb to subsequent downturns in the economy.” Similarly, Birch and Shuria (200, 46) write that in places like the Horn of Africa where drought is not an occasional risk but an inevitable frequent phenomenon, restocking may not be a feasible option. This is due to the fact that the next drought that comes so early

before the recovery attempt matures will sweep away all the animals of the restockee households.

Pastoralists have also responded to the constraints listed above. For example, the increasing displacement of the majority of the pastoralists in the Sudan by the unabated expansion of large-scale mechanized farming forced them to devise, at grater social and economic costs, new mobility patterns to allow themselves longer periods of stay in the increasingly squeezed dry-season grazing grounds (Shazali and Ahmed 1999). Others were forced to settle down and to undertake farming in order to avoid the purchase of their staple grains. Those who settled in the urban fringes have been transformed into milk vendors depending on their small herds of cows and goats (Mohamed Salih 1985). In this pursuit, they had to endure the hardships associated with the competition imposed upon them by the proliferation of modern dairy farms and imported reconstituted milk. Herd management is practiced by women while most men are involved in selling firewood and charcoal or in eking out a living in the urban informal sector (El Nagar 2001).

5. POLICIES MITIGATING THE IMPACT OF DROUGHT

The policies proposed by different governments, researchers and development agencies for reducing the vulnerability of pastoralism to drought may be classified according to: (a) the time horizon within which the policy is to operate: at one extreme immediate short-term measures to mitigate the impact of drought on human and animal populations - such as food supplementation and health programs - and at the other, policies aimed at creating the framework within which pastoral productivity can be maintained at a stable or increasing levels over the long term; and (b) the weight given by projects to maintaining current levels of human population directly dependent on livestock production - some proposals recognize the importance of the pastoral sector as a source of employment and livelihood. While some observers suggest that pastoralism can support as many as seven times the human population on the same piece of land as can ranching, others emphasize the need for transforming the way in which production is organized in favor of more capital-intensive production techniques.

5.1 Short-term Policies

Short-term policies aimed at moderating the impact of drought on pastoral households include:

(1) Herd security policies. These are policies aimed at reducing livestock losses from mortality during and in the post-drought recovery phase. They may take the form of vaccination campaigns and fodder and mineral supplementation, to deal with reduced resistance to disease and to make up for a temporary shortfall in pasture particularly during the drought period. These supplementary measures are considered of special importance in minimizing losses among breeding females and young animals which have long-term consequences for herd structure and rates of growth in the post-drought period. The establishment of irrigated feed production in times of drought can provide a source of supplementary fodder for calves and breeding cows. De-stocking measures at the onset of drought, which would assure a higher probability of survival for remaining animals, should be accompanied by the provision of alternative forms of earning a livelihood and the assurance of the means by which to rebuild stock holdings in the post-drought period.

(2) Food security policies. These are policies aimed at providing some of the food for the human population. They may take the form of subsidized grain sales or the provision of famine relief, to provide the destitute with subsistence and to reduce the pressure on depleted holdings of stock—as suppliers of milk and sources of cash. Sales of stock during periods of drought may represent a very high proportion of total losses, many of these sales were taking place to finance grain purchases, and indicating the acute stress faced by pastoral households in providing for their immediate

subsistence needs as herd productivity falls and relative prices change. One of the immediate impacts of drought is reduction of milk production. Thus, the competitive demand between human and young animals for milk will also grow in times of crisis, leading to higher rates of calf mortality, slower growth to maturity, and herd rebuilding in the post-drought period can only take place rapidly where the major part of each lactation is left to the calf, kid or lamb.

(3) Market intervention policies. These are policies aimed at moderating the adverse shift in the terms of trade between livestock and cereals. They are concerned in assuring supplies of grain through the creation of communal grain reserves in pastoral areas or facilitation of grain flow from other regions to the pastoral areas. Alternatively, policies try to act by controlling livestock prices and marketing, by guaranteeing certain prices for livestock or by improving transport facilities. In order to reduce the pressure on pastoralists to sell their female animals, governments could intervene in the market by buying animals, by banning the export of female animals and by imposing a differential slaughter tax on animals of different sex and age. There is also a need for minimizing losses of livestock capital as a consequence of rapid de-stocking at the onset of drought before livestock prices, their physical conditions, and levels of productivity start to fall dramatically. In this context, it might be useful to set up a national livestock bank at the start of a drought whereby herders could convert stock in tokens for subsequent re-conversion into livestock in the post-drought period. However, a sufficient number of female-stock might not be found to meet the demand of herders wishing to re-convert their tokens in the years immediately following the drought.

(4) Restocking policies. These measures have as their purpose the reestablishment of pastoral households as independent herders and are often based on the rapid rates of growth obtained from small stock and their consequent advantage in rebuilding livestock capital. In the immediate post-drought herd reconstruction, pastoralists tend to prefer a holding of 10 sheep or goats rather than a single cow to rebuild their herds. An initial stock of 10 goats (of which nine are females) could be expected after two to three years to have reached 30 to 40 animals with which it would be possible to reinvest in a herd of cattle. The importance of encouraging herd rebuilding is especially great where farming (or some other income-generating activity) cannot be combined with livestock keeping, or only at a great cost. Enabling the pastoral household to be independent of other sources of income may assure a higher rate of livestock productivity than if herding is constrained by involvement of the household in another sector particularly one that requires change in land use in favor of the non-pastoral activity.

5.2 Long-term Policies

The long run policy measures should focus on the reduction of vulnerability to drought via agricultural growth in the form of livestock production at household level; poverty alleviation; and increased ecological sustainability (Coppock 1994, 269). These in turn call for a number of livestock and range management research works and policies as well as human development policies aimed at stimulating emigration out of the pastoral system.

Focus on establishing forms of land and stock management by means of which a flexible balance between changing pasture resources and livestock numbers are maintained is based on the definition of carrying capacities for pastures under different rainfall conditions and on the establishment of methods by which to assure that changes in pasture productivity, either by movement of animals to other areas or by de-stocking and sale of herds. This is in line with the general convention that it is necessary to establish systems for adjusting livestock numbers that precede or accompany changes in ecological conditions rather than those which follow them.

Range management research in this regard would indicate the extreme variability of primary production from year to year according not only to total rainfall but also the distribution of rainfall, soil composition, species composition of sward and the intensity of exploitation. Given this great annual variability, Sandford (1976) suggests a distinction between “opportunistic” and “conservative” stocking rate policies. The latter would involve maintaining livestock numbers at the minimum carrying capacity of the range under the worst rainfall conditions, so that pasture would be sufficient for stock even in the least favored years, while the former would refer to a variable level of stocking that took account of changes in pasture productivity and made maximum use of years of high pasture production. Although the “opportunistic” stocking policy would reap greater returns by making maximum use of grazing resources, there would be the associated difficulties in estimating and allocating changes in animal holdings among producers in any scheme when pastures failed.

A variety of institutional forms have been recommended within which to introduce livestock management changes (usually in association with other measures such as the provision of water and health services) which range from loose associations of herders, through the demarcation of land associated with a pastoral section or group of households to the allocation of land to commercial ranching. The underlying assumption behind many of these schemes that identify a certain group of individuals with a fixed area of land is that only under these conditions will there be an equalization of social and private costs and benefits, such that herder-owners benefit from the investment that they make in conserving pasture resources. Some degree of privatization of land is seen as the only means by which the “tragedy of the commons” may be avoided.

However, privatization of land may be neither a necessary nor a sufficient condition for sound range management. It is too simplistic to associate communal pasture with inevitable bad management of resources and individual or corporate ownership with good husbandry. Communal ownership can exist with some degree of control over range and livestock numbers and it is only by maintaining traditional forms of land tenure that the interests of the poorest may be preserved. Moreover, there are several examples of communal grazing systems in which control over stocking rate has been achieved. There are equally numerous examples of private ranches in which stocking rates have been very much higher than would ensure long-term ecological balance. The latter could be attributed to the pressure felt by ranchers of gaining a fast return on capital, or for the smaller rancher of taking a higher risk by maintaining stocking rates at a level above larger and more conservative neighbors.

Demarcation of land in semi-arid zones into units that are ecologically viable in years of poor rainfall may be impossible except by taking enormous tracts of land. This is essentially the case because there will be a need to make provision for some movement of stock between ranches in case where localized rainfall has produced very variable pasture conditions. This point was made in the context of the Northeast Rangeland Project in Ethiopia whereby it was recognized that the minimization of risk due to highly localized patterns of rainfall and pasture production demands the free movement of animals over the whole area.

The formulation and execution of policies in the livestock sector are necessarily influenced not only by considerations of vulnerability of traditional systems of pastoral production to drought but also by the economic and political power of different groups.⁷ The various interventions that have been made and the very unequal gains accrued to different livestock owners are closely related to differential access to resources and political power. For too long, pastoral systems of production have been falsely taken as isolated from the wider economic and political environment of which they are part. To understand the current direction of development in pastoral production systems, an approach is needed that takes into account not only the technical problems faced by livestock production in areas of variable pasture productivity and subject to

⁷ For example in Ethiopia, all the available studies confirm that there is no any clear policy for pastoral/agro-pastoral areas. Most of the extension packages and approaches are mainly designed for the highland crop producing areas and do not fit with pastoral/agro-pastoral production systems (Fasil *et al.* 2001: 48). The policy pursued so far is said to be 'Flexible Policy' (ibid.). It is impossible to set a good policy that serves the pastoralists in a situation where a single sectoral-ministry (Ministry of Agriculture) is handling development in pastoral areas of the country.

occasional widespread droughts but also the relations that exist between producers within the livestock sector, other sectors of the economy and the state.

6. CONCLUSIONS

The purpose of the literature review has been to identify policy and research implications on post-drought recovery strategies of pastoral households in the Horn of Africa. To this end, the review first delineates the pastoral sector based on selected characteristics that are of particular importance in identifying pastoral resource allocation behavior in response to environmental factors. These features include: (i) dependence on livestock which implies, among other things, the importance of livestock preservation and/or the generation of internal and external capacity to make livestock available to the pastoral households during the post-drought phase as vital strategy to facilitate recovery; (ii) the dominance of arid and semi-arid environment that orients pastoral production to consider such elements as drought coping and recovery via complex herd management and land tenure arrangements; (iii) multiple resource use that suggests the existence of diverse arrangements of resource access and use; (iv) the issue of change and adaptation which stresses that the pastoral production system has been dynamic and adaptive to changing ecological and socio-cultural environment; (v) the role of differentiation of pastoral societies within and between groups, which implies the existence of different levels of vulnerability, informing selective interventions to fit well into the various circumstances; and (vi) their geographical location in the Horn region that to certain extent dictated production and marketing strategies owing to access to cross-border movements for better pasture and water as well as better prices for their products and purchases.

The review then presents country profiles of pastoralism focusing on the sector's role in the economy, development interventions attempted in different periods and their problems as well as the current status of pastorlists/ago-pastoralists. The profile primarily focused on Ethiopia and Sudan due to the short time given to the study. Some information is also included on Somalia, Eritrea and Djibouti. In all cases, however, this review doesn't claim to be exhaustive. Attempt has only been made to consult recent works on pastoral issues in the Horn of Africa focusing on drought related issues. The reviewed materials reveal that the pastoral sector in the Horn of Africa sub-region supports the livelihoods of millions of people who occupy about 70% of the land area. However, people who depend on the performance of this sector are increasingly finding it difficult to sustain their livelihoods. Rather, pastoralists in this sub-region are among the poorest and many hardly survive without relief assistance. Various interdependent internal and external factors that lead to resource shrinkage are identified behind this dismal predicament. These factors include resource shrinkage as a result of population, drought, development intervention failures and conflicts, to mention but a few.

Starting from the Sahelian drought of the 1970s, pastoralists in the Horn of Africa are gaining international attention and relief aid. However, the continuing tragedies caused mainly by drought and other external pressures remain unresolved. The review indicated that many pastoral people in the Horn seem to have become increasingly vulnerable to drought. The various studies referred to converge to a consensus that drought in the pastoral areas of the Horn of Africa is no more an occasional risk, but a frequent phenomenon. As a consequence, the issue of drought and its management in these areas have attracted much research and have been a priority research agenda in discussions on pastoral production systems. These studies have availed information to policy and program options intended to deal with the impacts of drought on pastoralists and coping mechanisms both by the pastoralists themselves and by the assistance from external agents.

Concerning drought coping mechanisms of pastoralists in the Horn of Africa, the review identifies some ten ways used by different pastoral groups in the region. These mechanisms revolve around household consumption adjustment, herd and range management as well as income supplementation. These are: (i) movement to places where the availability of pasture and water are relatively better; (ii) herd diversification in favor of resilience to drought, (iii) herd splitting; (iv) herd expansion and dispersal; (v) dispersal of resources and assistance from relatives; (vi) forage supplementation, (vii) generation of food stores; (viii) sale of non-livestock assets; (ix) income generation from non-pastoral activities; and (x) reduction of food intake and change in diet composition.

Due to the fact that the impacts of drought are beyond the capacities of pastoralists, external agents including national governments and the international community are often involved at various stages of drought. The common intervention areas include, among others, facilitating pastoral movement to secure grazing lands in other places; provision of food and feed to save lives of human beings and animals respectively; and assistance in human and animal health services to protect outbreaks of diseases. These interventions by external agents are not without problems. In this regard, it is indicated that some short-term responses may result in undesirable consequences in the long run sustainability of the system (Helland: 1997b). However, some have positive implications in the post-drought recovery period.

In the inter-drought cycle, the post-drought recovery phase comes between the drought period and the high-density phase. This period is important in countries where other employment options are limited and hence pastoral emigration out of the system is difficult. During the recovery period, pasture and water availability in the area reaches its height but most of the households have already exhausted their livestock; and hence stocking rates are low particularly in terms of large ruminants. As a result, the need for breeding stock by pastoral households is high. According to the available

sources, in the post-drought period, household recovery strategies include asset recovery through purchase of breeding stock with own saving or livestock or financial support obtained from relatives or friends. The other common response in the recovery period is sedentarization and farming. This is particularly done by those households who are unable to fully recover in the pastoral system and who have to supplement their income from farming. Households also migrate for wage labor to compensate the reduced income as a result of drought and to obtain cash to purchase animals in the post drought period. Some households also engage in small-scale business such as petty-trade. In the Horn of Africa region, due to the location of the pastoral areas which provide many with easier access to external markets, cross-border livestock and manufactured goods trade has become a major source of employment for many people.

It has been noted by some studies in the Horn of Africa region that in a post-drought period, only part of the pastoral households are able to recover on their own. In fact, pastoralist's own coping and recovery strategies are becoming increasingly incapable due to a number of factors. Therefore, intervention at various stages of drought by external agents including governments and NGOs is vital to manage the crisis and save lives. During the post-drought recovery period, these groups could help pastoralists in both direct and indirect ways. Indirectly, they could institute an effective early warning system that would help improve drought management capacity of both agencies and households. The direct ways where the intervention by external agents during recovery is sought include: (i) assisting restocking through livestock supplementation to help some households establish themselves in the pastoral sector; (ii) promotion of those development interventions that are likely to succeed under low stocking rates including site reclamation, calf management, sustainable cultivation, milk and small ruminant marketing; and (iii) assisting those households who should emigrate out of the system and be accommodated in other sectors. It should be noted here that the interventions during the drought period are relevant to the post-drought recovery period and vice-versa.

Post-drought recovery strategies in the Horn of Africa are constrained by several resource shrinking factors including (i) expansion of agricultural projects, (ii) expansion of wildlife parks and sanctuaries, (iii) expansion of agro-pastoralism, (iv) encroachment of the rangeland by unwanted species, (v) insecurity, (vi) population growth, and (vii) high drought frequency. Most of these constraints are generally structural in nature and are unlikely to be resolved in the foreseeable future; and it seems that these areas would remain the center of crisis management for a long time to come.

Some short and long-term policy measures that need to be considered in mitigating the impacts of drought are suggested by some studies. The short-term policy measures are: (i) herd security policies that involve livestock supplementation measures to facilitate restocking in the recovery period; (ii) food security policies aimed at improving human food especially for those who have to purchase cereals during recovery period to supplement their calorie requirements as well as at reducing human competition for milk with calves during drought and hence preserve livestock for recovery; (iii) market intervention policies targeting the maintenance of favorable terms of trade during drought and allowing asset preservation for recovery; and (iv) restocking policies to facilitate recovery in the sector and to discourage the change in land use in favor of the non-pastoral sector. The long-term policy measures have put due emphasis on the reduction of vulnerability to drought via development in the form of livestock production; poverty alleviation; and increased ecological sustainability. Nevertheless, further research is yet to uncover much of the details of these short and long term policies in the context of the circumstances of each pastoral community.

The following research implications can be drawn from the review:

1. *Different phases of the inter-drought cycle and relationships between them:* Pastoral studies for the Horn of Africa region generally deal with the drought period only. However, the review has indicated that the post-drought recovery and high-density phases are affected by actions taken during the drought period. It is in fact observed that there are similarities in some cases and contradictions in others. Therefore, further research may explore the relationships in detail and identify policy and intervention options and approaches required in the various phases of drought.
2. *Short-term and long-term intervention areas in different pastoral societies:* The particularities arising from their geographical environment and traditional resource management practices would suggest different opportunities and constraints to both drought coping and post-drought recovery strategies as well as pastoral transformation. Further research would therefore explore these opportunities and constraints implied to each pastoral community and design relevant coping and recovery strategies in the short run and transformation in the long-run.
3. *Short and long-term interventions areas for different households in each pastoral society:* The review has indicated that pastoral societies are internally differentiated and that they require customized interventions. For instance, recovery assistance by external agents can be less expensive and sustainable if it is extended to relatively better households than to the poorest section of the society, who may be better accommodated in other sectors of

the economy. In relation to this, further exploration may be required to identify short-term employment diversification and long-term transformation approaches to different households, taking into account their socio-economic background.

4. *The role of bilateral relations in cross-border trade and resource management:* Many pastoral communities in the Horn of Africa are found bordering other pastoral groups in neighboring countries. As a result, an age-old cultural and economic ties have been established. These relationships have several implications on drought coping and recovery mechanisms. For example, pastoral movements would require mobility, including to grazing lands in the neighboring countries. Similarly, changes in relative prices of commodities involving products and purchases of pastoral societies would suggest cross-border movements in order to access the better markets in the neighboring countries.
5. *Dealing with the constraints and the future of pastoralists:* Resource management projects and grazing reserves schemes have not succeeded in offering the pastoralists any of the modern inputs they promised. They failed to offer the pastoralists a viable alternative in terms of an efficient modern input delivery. Drug stores are empty, boreholes non-operational and favorable marketing outlets non-existent. The question is what does the future hold for the pastoralists? What are the chances for opening up new grazing reserves amidst the unfettered expansion of large-scale mechanized farming?
6. *The role of institutions and sectoral coordination:* Studies have acknowledged the complexity of the problem that the pastoral societies in the Horn are facing now. It is indicated that a certain sector specific government department or piecemeal efforts of a few NGOs can hardly address it. For example, Coppock (1994: 270) mentions the case of Borena pastoral groups of Ethiopia, and writes:

The time when one development agency or a few technologies could have a significant impact on the Borena system is now over. Managing the system for widespread impact today requires a greater focus on policy and coordinated action among several development agencies and government ministries.
7. Given high population pressure and high drought frequency on the one hand and lack of alternative employment options in other sectors of the economy on the other, the interventions expected from various agencies are very high indeed. However,

implementation arrangements including the role of different institutions and/or institutions that may need to be in place would call for further investigation.

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